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MEMORANDUM FOR The Distribution List

From: Arnold Jackson *[signed]*
Acting Chief, Decennial Management Division

Subject: 2010 Census Coverage Measurement Independent Listing Quality Profile - Revised

Attached is the revised 2010 Census Coverage Measurement Independent Listing Quality Profile. The Quality Process for the 2010 Census Test Evaluations, Experiments, and Assessments was applied to the methodology development and review process. The report is sound and appropriate for completeness and accuracy. The revisions are a result of a change to the outgoing error rate variance formula shown in the Methodology section. This change reduced the estimated outgoing error rate variance, which also tightened the 90 percent confidence interval from (0.06 percent, 0.25 percent) to (0.06 percent, 0.24 percent).

If you have questions or comments about this report, please contact Ryan Cecchi at (301) 763-0301 or Andrea Chamberlain at (301) 763-5945.

Attachment

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November 30, 2011

2010 Census Coverage Measurement Independent Listing Quality Profile

FINAL - Revised

U.S. Census Bureau standards and quality process procedures were applied throughout the creation of this report.

Ryan Cecchi
Decennial Statistical Studies Division

Version	Date	Change	Reason	Location
2010-H-01	6/9/2011	Initial Release		
2010-H-01R	12/7/2011	See below		
		Corrected Outgoing Error Rate Variance formula	To correct the Outgoing Error Rate Variance formula	Section 2.3.2, page 11
		Corrected the 90 percent confidence interval for the estimated Outgoing Error Rate	Since the Outgoing Error Rate Variance formula changed, the confidence interval had to be updated	Section 4.3.6, page 27 and Section 5.1, page 29

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Executive Summary

This quality profile presents the results of the 2010 Census Coverage Measurement Independent Listing Quality Assurance program. The Independent Listing is the first field operation in the Census Coverage Measurement process and occurred, along with its Quality Assurance components, from August 28, 2009 to December 12, 2009. Its purpose is to obtain a complete housing inventory of all the addresses within the Census Coverage Measurement sample block clusters[1]. The 2010 Census Coverage Measurement housing inventory was comprised of housing units and potential housing units that listers recorded in Independent Listing Books for the sample block clusters. Listers also identified the location of each housing unit by assigning it a map spot on a Census Coverage Measurement block map.

The objective of the 2010 Census Coverage Measurement Independent Listing Quality Assurance program was to ensure that listers correctly canvassed their assigned block clusters and properly listed and map spotted all valid housing units and potential housing units. This objective was accomplished through the following quality assurance activities:

- Initial Observation of listers
- Crew Leader Edit of listers' work
- Office Edit of listers' work
- Dependent Quality Check of listers' work by Dependent Quality Check listers
- Initial Observation of Dependent Quality Check listers
- Quality Control Crew Leader Edit of Dependent Quality Check listers' work
- Dependent Quality Check Office Edit of Dependent Quality Check listers' work

To help ensure that the listers knew how to list a block cluster correctly, after making initial work assignments, the crew leader observed each lister in his/her crew perform the block cluster listing. Likewise, to ensure that the Dependent Quality Check listers knew how to perform the Dependent Quality Check correctly, the quality control crew leader observed each Dependent Quality Check lister in his/her crew. All crew members should have undergone Initial Observation as soon as possible after training in order to receive individual feedback so that he or she could correct erroneous listing behavior and improve listing performance. The (quality control) crew leader recorded the results of the observation on the Observation Checklist, Form D-1222(CCM-IL) for the United States and Form D-1222(CCM-IL)(PR) for Puerto Rico. The results of the Initial Observation show the following:

- Every lister and Dependent Quality Check lister should have undergone Initial Observation. However, only 82.6 percent of crew members were observed.

- The majority of the crew members (93.2 percent) observed had a final result of "Satisfactory" during the Initial Observation. The task incorrectly performed the most by

[1] A sample block cluster is a small geographic area, consisting of a single census block or group of census blocks, that is included in the Census Coverage Measurement program. It is the basic unit for data collection by Census Coverage Measurement listers or other field staff.

the listers during the observations was recording complete information about each housing unit in appropriate section(s) of the Independent Listing Book (15.9 percent). The task that Dependent Quality Check listers incorrectly performed the most during the observations was following proper procedures when the lister listed the wrong block (27.6 percent).

The Independent Listing Book(s) and associated Census Coverage Measurement map(s) for each block cluster underwent edits in the Regional Census Centers after listing and then again after the Dependent Quality Check. The purpose of these edits was to ensure that the listings of addresses and their associated information in the Independent Listing Books were complete and properly map spotted on the Census Coverage Measurement block maps. Each block cluster required an office edit after listing and a Dependent Quality Check office edit after undergoing the Dependent Quality Check. The office editor recorded the results of these edits in Section 3 of the Independent Listing Books. The results of the office edit and Dependent Quality Check office edit show the following:

- According to the results from the Office Edit Sub-sections in Section 3 of the Independent Listing Book, 90.7 percent of the block clusters had a listing office edit result of "Pass" and 1.1 percent of the block clusters had either no result marked or both "Pass" and "Fail" marked. For the Dependent Quality Check office edit, 96.7 percent had a result of "Pass" and 2.9 percent of the block clusters had either no result marked or both "Pass" and "Fail" marked.

After the listing office edit, each block cluster underwent a Dependent Quality Check to verify that the lister visited the correct block(s) and correctly listed and map spotted the housing units in the block cluster. This Dependent Quality Check was designed to identify significant listing and map-spotting errors and to provide an assessment of the lister's work on each block cluster. The Dependent Quality Check entailed a dependent verification, from ground to Independent Listing Book, of the listing and map spotting of the housing units represented by a sample string of 12 consecutive basic street addresses[2]. A block cluster failed the Dependent Quality Check if the Dependent Quality Check lister detected one or more critical errors. If a block cluster failed the Dependent Quality Check, the Dependent Quality Check lister rectified the block cluster by performing a 100-percent dependent verification of the listing from ground to Independent Listing Book of the entire block cluster. The Dependent Quality Check lister recorded the results of the Dependent Quality Check in Section 3 of the Independent Listing Book. The Dependent Quality Check ensured an Average Outgoing Quality Limit of 3.0 percent. The Average Outgoing Quality Limit represents the worst average outgoing quality in terms of lines recorded in error across all block clusters that we can expect from our designated Quality Assurance plan. The results of the Dependent Quality Check from Section 3 of the Independent Listing Book are as follows:

[2] A basic street address is the house number (including any letters and fractions) and street name portion of an address. For example: 11 Main Street and 11 ½ Main Street are both basic street addresses. In multiunits where the unit designation comes after the street name, all individual units share the same basic street address. For example: 11 Main Street Apt. A and 11 Main Street Apt. B share the same basic street address (11 Main Street).

- The Dependent Quality Check listers determined that the listers listed the wrong block cluster and the block cluster underwent a "Redo" in production on 0.3 percent of the block clusters. However, about 28 percent of the total tasks performed incorrectly by the Dependent Quality Check listers during Initial Observation dealt with following the proper procedures when the lister listed the wrong block cluster. Therefore, the actual percent of block clusters where the listers listed the wrong block cluster could be greater than 0.3 percent due to the Dependent Quality Check listers having trouble with this task.

- About 80 percent of the block clusters had a Dependent Quality Check result of "Pass" recorded in Section 3 of the Independent Listing Books and about 19 percent had a Dependent Quality Check result of "Fail." Less than one percent of the block clusters showed procedural errors in how the Dependent Quality Check result was recorded (multiple results marked, no result marked, "Fail/Redo" marked as the final result).

- Of the 2,683 listers that performed work, 49.9 percent failed the Dependent Quality Check at least once. More specifically, 28.3 percent of the listers had only one block cluster fail the Dependent Quality Check and 12.9 percent had only two of their block clusters fail the Dependent Quality Check.

- The percent of block clusters with a Dependent Quality Check result of "Fail" or "Fail/Redo" was 19.4 percent, while 19.8 percent of block clusters had one or more critical errors recorded in Section 3 of the Independent Listing Books, thereby procedurally requiring a Dependent Quality Check result of "Fail."

- About 97 percent of block clusters were correctly sampled in the Dependent Quality Check.

- The majority of all critical errors detected during the Dependent Quality Check (55.1 percent, found in approximately 12 percent of all block clusters) showed that the Dependent Quality Check listers corrected a basic street address's map spot number, type of unit, unit status, or address information in Section 4 – Listing Page of the Independent Listing Book. The second most frequent critical error detected was Dependent Quality Check listers having to add basic street addresses to Section 4 of the Independent Listing Book that listers missed (15.3 percent, found in approximately five percent of all block clusters), followed by Dependent Quality Check listers having to delete basic street addresses from Section 4 that listers erroneously listed (13.8 percent, found in approximately three percent of all block clusters).

- There was an estimated total of 581,473 basic street address listings in Section 4 of the Independent Listing Books over all block clusters, with 19.2 percent of these listings being checked during the Dependent Quality Check. This rate is greater than the Quality Assurance Plan's estimate of a 15.8 percent sample (Cecchi, 2008). A total of 32.5 percent of Section 4's listings were checked by the Dependent Quality Check listers after rectification. This was determined by analyzing the number of Section 4 listings checked during the Dependent Quality Check for all block clusters plus the additional number of

listings checked during rectification for block clusters with one or more critical errors recorded in Section 3 of the Independent Listing Books.

- Most of the block clusters with critical errors recorded in Section 3 (95.2 percent) had rectification data recorded. From the rectification data entered in Section 3 of the Independent Listing Books, Dependent Quality Check listers added a total of 6,094 units that the listers missed (0.7 percent of total estimated housing units), deleted a total of 5,185 non-housing units that the listers listed (0.6 percent of total estimated housing units), and corrected a total of 17,762 unit addresses listed (2.0 percent of total estimated housing units). Our estimate of total housing units is from Section 1, item 10, "Total number of housing units listed in the cluster" of the Independent Listing Book.

- Of all the basic street address listings in Section 4 of the Independent Listing Books by the listers, an estimated 5.27 percent contained one or more critical errors. After the Dependent Quality Check and rectification, we estimate that, at most, 0.15 percent of total listings were uncorrected by the Dependent Quality Check listers and, therefore, remained in error. This estimated outgoing error rate is well below the desired average outgoing quality limit of 3.0 percent set forth in our Quality Assurance Plan (Cecchi, 2008).

Recommendations:

We recommend the following actions to improve the Census Coverage Measurement Independent Listing Quality Assurance program:

- **Stress the importance of the (quality control) crew leaders needing to completely fill out the required items on the Observation Checklists. Items such as Field Representative Code, Result, etc., should not be left blank. A quick office edit when these checklists are received by the Regional Census Centers might take care of this problem. Automating the Observation Checklists would also be ideal.**

- **Change the procedures requiring the (quality control) crew leaders to complete an Observation Checklist for crew members that are assigned work, but resign before completing any work. The 2010 procedures required the (quality control) crew leader to fill out the identification items of the crew member that resigned, to mark "Other" as the result, and to enter notes explaining that the crew member resigned before completing work on an Observation Checklist. This resulted in unnecessary paperwork.**

- **Determine a better method to ensure that the listers, office editors, Dependent Quality Check listers, and quality control office editors completely fill out the required items in the Independent Listing Books. Items such as office edit results, "total number of lines used in Section 4 of the Independent Listing Book," information regarding the Dependent Quality Check sample, Dependent Quality Check Result, etc. were frequently left blank.**

- **Emphasize during lister training the importance of recording complete information about each housing unit in the appropriate section(s) of the Independent Listing Book, as well as map spot number. For Dependent Quality Check listers, more emphasis should be placed on following correct procedures when the lister listed the incorrect block cluster, along with the rectification of block clusters that fail the Dependent Quality Check.**

- **Emphasize during lister training how to record individual blocks with no living quarters, as well as entire block clusters with no living quarters. The Dependent Quality Check lister training should stress how to perform and document the Dependent Quality Check for those block clusters with no living quarters.**

- **Consider verifying multiple Dependent Quality Check sample strings for large block clusters with more than one Independent Listing Book, perhaps by selecting a random start number for each Independent Listing Book. This would increase the chance of the Dependent Quality Check lister discovering critical errors in the listing of the block cluster.**

- **Consider reducting the size of the Dependent Quality Check sample string from that specified for 2010 if multiple sample strings are selected for large block clusters, in order to maintain our overall sampling rate.**

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1. INTRODUCTION

1.1. *Independent Listing Operation*

The Independent Listing (IL) is the first field operation in the Census Coverage Measurement (CCM) process. Its purpose is to obtain a complete housing inventory of all the addresses within the CCM sample block clusters[3] before the 2010 Census enumeration commences. The CCM sample included block clusters in both the United States (U.S.) and Puerto Rico. The field operation for the 2010 CCM IL and the associated Dependent Quality Check (see Section 1.2.5, below) occurred from August 28, 2009 to December 12, 2009. The housing inventory is comprised of housing units (HUs) and potential HUs that listers recorded in Independent Listing Books (ILBs). Listers canvassed every street, road, or other place in their assigned block clusters where people might live and constructed a list of HUs as follows:

- the basic street address (BSA)[4] of each single-family house, multiunit, mobile home/trailer not in a park, mobile home/trailer park office, or other HU, such as a camper or tent, in Section 4 – Listing Page of the ILB
- for the BSA of a multiunit in Section 4, each unit in Section 5 – Multiunit Address Page of the ILB
- for the BSA of a mobile home/trailer park office in Section 4, each unit in the mobile home/trailer park in Section 6 – Mobile Home Park Page of the ILB

The listers also identified the location of each HU by assigning it a map spot on a CCM block map provided with their assignment materials. A block cluster may consist of one or more geographically contiguous blocks and a block cluster may have one or more completed ILBs, depending on the size of the block cluster. The remaining sections of the ILB are Section 1 – Identfication, Section 2 – Assignment Information, and Section 3 – Quality Assurance. Sections 1-6 of the ILB can be seen in Appendix C. Group quarters, such as dormitories, health-care facilities, and military baracks, were not included in IL.

The information in the completed ILBs was keyed at the National Processing Center (NPC) and the address or HU entries were matched against the census Universe Control and Management File (UC&M) for the same areas. Non-match, possible match, possible duplicate, possible group quarters status, and unresolved HU status cases were sent to the field for Initial Housing Unit Followup (IHUFU), the next field operation of the CCM, to collect additional information meant to help resolve the differences between the IL results and the UC&M.

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[3] A sample block cluster is a small geographic area consisting of a single census block or group of census blocks that is included in the Census Coverage Measurement program. It is the basic unit for data collection by Census Coverage Measurement listers or other field staff.

[4] A basic street address (BSA) is the house number (including any letters and fractions) and street name portion of an address. For example: 11 Main Street and 11 ½ Main Street are both BSAs. In multiunits where the unit designation comes after the street name, all individual units share the same BSA. For example: 11 Main Street Apt. A and 11 Main Street Apt. B share the same BSA (11 Main Street).

1.2. *Quality Assurance Program*

The objective of the IL Quality Assurance (QA) program was to ensure that the listers correctly a) canvassed the streets, roads, and other places where people might live in their assigned block clusters, b) constructed a list of valid HUs in the ILBs, c) identified the locations of the HUs by assigning map spots on the CCM block maps, and d) updated the CCM maps as necessary. This objective was met through the following QA activities, which are discussed briefly in subtopics below:

- Initial Observation of Listers
- Crew Leader Edit
- Office Edit
- Dependent Quality Check (DQC)
- Initial Observation of DQC Listers
- Quality Control (QC) Crew Leader Edit
- DQC Office Edit

An independent QC staff in the field and office was maintained to ensure objectivity from IL production. For detailed information about the IL QA program, please see DSSD 2010 Census Coverage Measurement Memorandum Series #2010-D5-01, "Quality Assurance Plan for the 2010 Census Coverage Measurement Independent Listing Operation" (Cecchi, 2008).

1.2.1. *Initial Observation of Listers*

To help ensure that the listers knew how to list a block cluster correctly, the Crew Leader (CL) or a CL Assistant observed each lister perform all or part of the listing of a block cluster. All listers were to undergo Initial Observation as soon as possible after training. We considered Initial Observation as a continuation of training, rather than a test of the lister's ability. Since listers were new to the process, a few errors committed during the observations were to be expected. The point of the observation was to provide individual feedback to each lister so that he or she could correct erroneous listing behavior and improve listing performance early in the operation.

The CL recorded the results of the observation on the Observation Checklist, Form D-1222(CCM-IL) for the U.S. or Form D-1222(CCM-IL)(PR) for Puerto Rico. An illustration of the Form D-1222(CCM-IL) is shown in Appendix B. The observer evaluated the lister's performance on each task listed in Section A of the Observation Checklist by marking Columns Y (task performed correctly), N (task not performed correctly), or NA (task not applicable) under the "1st Observation" columns.

After the observation, the CL entered the outcome of the observation in Section C of the Form D-1222(CCM-IL)/Form D-1222(CCM-IL)(PR) by checking (✓):

- "Satisfactory," if the lister had a good understanding of procedures by the end of the observation
- "Unsatisfactory," if the lister did not have a good overall understanding of procedures
- "Other," if the lister was not observed because he or she was no longer working (for example, the lister quit before the observation).

A second observation was required when a crew member received an outcome of "Unsatisfactory" after the first observation. If a second observation was performed, the CL made no entry in Section C of the Form D-1222(CCM-IL)/Form D-1222(CCM-IL)(PR) for the first observation, but instead completed Section C based on the second observation. The CL used the same Form D-1222(CCM-IL)/Form D-1222(CCM-IL)(PR) for both the first and second observations, recording his/her evaluation of the lister's performance on the tasks listed in Section A under the "2nd Observation" columns for the second observation.

1.2.2. *Keying and Filing of the Observation Checklists*

After the observation, CLs submitted the completed Form D-1222(CCM-IL) or Form D-1222(CCM-IL)(PR) to the Regional Census Centers (RCCs) or Puerto Rico Area Office (PRAO). There, clerks in the office keyed information from the checklists into the Coverage Measurement Operations Control System (CMOCS).

The clerks in the RCCs/PRAO filed the Observation Checklists until the end of the operation. Within a week after the completion of IL and the DQC, the RCCs/PRAO shipped all completed Forms D-1222(CCM-IL)/Form D-1222(CCM-IL)(PR), via FedEx, to the NPC. This included the Forms D-1222(CCM-IL)/Form D-1222(CCM-IL)(PR) used for the observation of the DQC listers (see Section 1.2.6, below).

Clerks in the NPC keyed and verified the data on the Observation Checklists. The NPC then created an output file of the keyed data and delivered it to the Decennial Statistical Studies Division (DSSD) Quality Assurance Branch (QAB) for analysis as part of this profile.

1.2.3. *Crew Leader Edit*

The CL was to edit the ILB(s) and CCM block cluster map(s) for each completed block cluster. The purpose of the crew leader edit was to ensure that the listings in the ILBs and the associated map spots on the CCM block maps were complete and legible before sending them to the RCC/PRAO.

When the CL finished the crew leader edit and no further correction was necessary, the CL shipped the materials for the block cluster to the RCC/PRAO.

1.2.4. *Office Edit*

1.2.4.1. Performing the Office Edit

The ILB(s) and associated CCM map(s) for each completed block cluster also were to undergo an office edit by an office editor when they were received in the RCC or PRAO. Similar to the crew leader edit, the purpose of the office edit was to ensure that the listings in the ILBs were complete and properly map spotted on the CCM block maps.

After performing the edit for the block cluster, the office editor indicated the result of the edit in Section 3 – Quality Assurance, item 1. Listing Office Edit, in the ILB. If there were one or more critical errors, the block cluster failed the office edit and a DQC lister was to repair the detected critical errors during the DQC.

1.2.4.2. Performing the Repair

When the DQC lister received the ILB(s) and CCM map(s) for a block cluster for the DQC, he or she was to check if the block cluster required repair based on the office edit result. If a cluster required repair, the DQC lister was to repair each critical error identified by the office staff either before, during, or after the DQC, depending on the best path of travel. If the block cluster did not require repair, the DQC lister was to proceed with the dependent verification of the listing of the sample string of addresses (see 1.2.5, below).

1.2.5. *Dependent Quality Check*

Each block cluster that was independently listed was to undergo a DQC to verify that the lister visited the correct block(s) and correctly listed and map spotted the HUs in the block cluster. This DQC was designed to identify significant listing and/or map-spotting errors and to provide an assessment of the lister's work on each block cluster. The DQC entailed a dependent verification of the listing and map spotting from ground to book of all HUs in a sample string of BSAs that covered or should have covered 12 listing lines in Section 4 of the ILB. This set of 12 listing lines included:

- BSAs for a single-family house, a multiunit, mobile home/trailer not in a park, office for a mobile home/trailer park, or other HU that were listed by the lister, or

- BSAs for a single-family house, a multiunit, mobile home/trailer not in a park, office for a mobile home/trailer park, or other HU that were missed by the lister, or
- Non-HU BSAs erroneously listed by the lister.

A block cluster failed the DQC if the DQC lister detected one or more critical errors (see Section 1.2.5.6.1, below). If a block cluster failed the DQC, the DQC lister rectified the block cluster by performing a 100-percent dependent verification of the listing of the entire block cluster from ground to ILB.

If the DQC lister determined that the lister listed the wrong block(s), the DQC lister was to stop the DQC and return the ILB(s) and CCM map(s) for the block cluster to the QC CL. It was determined that the wrong block(s) was listed if the BSA on the line in Section 4 of the ILB that was designated as the starting point for the DQC, and the BSAs on the next 11 lines in Section 4 represented HUs that were not in the block cluster. The QC CL was to return the block cluster's materials to the RCC/PRAO and the original lister was to redo the listing of the block cluster accompanied by the CL.

1.2.5.1. *Statistical Quality Requirements*

1.2.5.1.1. Average Outgoing Quality Limit

The basis for the DQC was an acceptance sampling plan designed to achieve an average outgoing quality limit (AOQL) of three percent at the Section 4 listing line level. The AOQL represents the worst average outgoing quality (AOQ) in terms of lines recorded in error across all block clusters that we can expect from our designated QA plan (Cecchi, 2008). The Operating Characteristic (OC) curve plots the probabilities of accepting a block cluster (P(a)) over varying Section 4 listing line error rates (p′). Appendix D shows the OC curve and the AOQ curve, which plots the values of the AOQ over all possible values of p′, where AOQ=P(a) * p′. The highest point on the AOQ curve is our AOQL of 3.0 percent. These curves can also be seen in Attachment H of the 2010 CCM IL QA Plan (Cecchi, 2008).

1.2.5.1.2. Sampling Rate

The pre-production estimate of the IL workload was approximately 1,000,000 HUs over 13,075 block clusters or an average of 76 HUs per block cluster. We used this average to estimate the average number of Section 4 listing lines completed per block cluster. The DQC called for a verification of the listing of all the HUs represented by a sample string of BSAs on the ground, using a random start for each block cluster. The result was a minimum sampling rate of 15.8 percent.

The following table illustrates the statistics underlying our QA plan for the DQC based on the pre-production estimate of the average block cluster size (Cecchi, 2008).

Cluster Size (Average # Section 4 Listings)	Sample Size (# Section 4 Listings)	Sampling Rate	Number Defective Section 4 Listings Allowed	AOQL
76	12	15.8%	0	3.0%

Data Source: 2010 CCM Independent Listing Quality Assurance Plan.

1.2.5.2. *Selecting the Random Start*

For each block cluster, the Coverage Measurement Operation Control System (CMOCS) generated a random start number for the DQC. This number represented the line number of the BSA in Section 4 of the ILB that served as the starting point for the dependent verification of the listing and map spotting of all HUs represented by the sample string of BSAs on the ground for the block cluster.

1.2.5.3. *Verifying the Sample String of Addresses*

Beginning at the BSA indicated as the starting point for the DQC, the DQC lister was to canvass the block(s) and verify that the lister correctly listed and map spotted each HU represented by the starting address and at the next 11 consecutive BSAs on the ground that contained HUs. The DQC lister verified the lister's work by checking the units found on the ground to the lister's entries in the ILB(s) and on the CCM block cluster map(s).

1.2.5.4. *Rectifying a Failed Cluster*

When a block cluster failed the DQC due to one or more critical errors in the sample string of BSAs, the DQC lister was to rectify the block cluster by performing a 100-percent dependent verification of the entire block cluster from ground to ILB. For each block within the block

cluster, the DQC lister canvassed the block and verified that the lister correctly listed and map spotted each HU that the DQC lister located on the ground. The DQC lister verified the lister's work by checking the units found on the ground against the lister's entries in the ILB(s) and on the CCM block cluster map(s).

1.2.5.5. *Correcting Critical Errors*

When the DQC lister performed the repair of the errors marked for correction during the office edit or detected a listing or map-spotting error during the DQC, he or she was to correct the error according to the IL listing or map-spotting instructions. The DQC lister used a green pencil to correct **all** marked or detected errors.

During the DQC, the DQC lister was to determine if the wrong block(s) was listed. The lister listed the wrong block(s) if the BSA indicated as the starting point for the DQC and the BSAs on the next 11 lines in Section 4 of the ILB represented HUs that were not in the assigned block cluster. If the DQC lister found that the lister listed the wrong block(s), the DQC lister was to stop the DQC and mark the block cluster as "Fail/Redo" in the "DQC Results" in Section 3 of the ILB. Then he or she was to return the ILB(s) and CCM map(s) to the QC CL.

1.2.5.6. *Recording Results of Dependent Quality Check*

For each block cluster, the DQC lister was to record the results of the DQC in Section 3 of the ILB.

As the DQC lister verified the listing of each HU represented by the sample string's starting BSA and the next 11 consecutive BSAs on the ground that contained HUs, the DQC lister was to record the verification results in Section 3 – Quality Assurance, item 3. DQC Lister, on the inside cover of the ILB. For each listing that the DQC lister verified, added, or deleted in Section 4 of the ILB, he or she entered the following information on one line in the DQC Lister sub-section:

- Column (1) – Line number of the BSA representing one or more HUs that was either listed by the lister or added by the DQC lister
- Column (2) – Checkmark if there were no critical errors detected for the BSA or any unit represented by BSA
- Columns (3)-(11) – Checkmark in the appropriate column for each type of critical error detected for the BSA or any unit represented by the BSA

After recording the line numbers of the Section 4 listings verified in the sample string and marking the types of errors detected, the DQC lister was to record the number of checkmarks entered in each of Columns (2)-(11) in the Total line. The DQC lister then marked the DQC result in Section 3 – Quality Assurance, item 4. DQC Result, of the ILB as follows:

- Check the "Pass" box, if there were no errors recorded,
- Check the "Fail" box, if there was one or more errors recorded, or
- Check the "Fail/Redo" box, if the DQC lister determined that the lister listed the wrong block(s).

1.2.5.7. *Recording Results of Rectification of Cluster*

When the sample string of BSAs failed the DQC, the DQC lister rectified the block cluster by performing a 100-percent dependent verification of the entire block cluster. The DQC lister was to record the rectification results in Section 3 – Quality Assurance, item 5. Rectification, on the inside cover of the ILB. For each block rectified, the DQC lister was to enter the following information in one column in the Rectification sub-section:

- block number,
- total number of HUs added by the DQC lister after rectification,
- total number of HUs deleted by the DQC lister after rectification, and
- total number of HUs corrected by the DQC lister after the rectification.

1.2.6. *Initial Observation of DQC Listers*

Similar to the listers, each DQC lister was to undergo an Initial Observation as soon as possible after training. Again, the Initial Observation was considered a continuation of training, rather than an assessment of a DQC lister's ability. Like the listers, the DQC listers were new to the operation, so a few errors committed during the observation were expected. The purpose of the observations was to provide individual feedback to each DQC lister early in the operation to improve his or her performance. The instructions for the Initial Observation of the DQC listers were the same as those specified in Section 1.2.1, above, for the listers, except the QC CL used Section B of the Observation Checklist for the DQC lister tasks to observe and evaluate.

1.2.7. *Quality Control Crew Leader Edit*

After the DQC was performed, each block cluster required a QC crew leader edit. The purpose of the QC crew leader edit was to ensure that the DQC lister properly repaired the block cluster, if repair was necessary, performed the DQC and rectification, if rectification was necessary, and completed Section 3 of the ILB before the ILB(s) and CCM map(s) for the block cluster were returned to the RCC/PRAO.

When the QC CL finished the QC crew leader edit and no further correction was necessary, the QC CL shipped the materials for the block cluster to the RCC/PRAO.

1.2.8. *Dependent Quality Check Office Edit*

After the DQC, when the ILB(s) and CCM block cluster map(s) for a block cluster were received in the RCC or PRAO, information from Section 3 of the ILB was entered into the CMOCS. Following the check-in, the ILB(s) and CCM block cluster map(s) for each block cluster required a DQC office edit. Similar to the QC crew leader edit, the purpose of the DQC office edit was to ensure that the DQC lister repaired the block cluster (if repair was necessary), performed the DQC and rectification (if rectification was necessary), and completed Section 3 of the ILB.

After performing the DQC office edit, the office editor was to indicate the result of the edit in Section 3 – Quality Assurance, item 6. DQC Office Edit, in the ILB. If there were one or more critical errors detected, the block cluster failed the DQC office edit and was sent back to the field for the DQC lister to repair.

1.3. *Objective of Report*

This report presents summary statistics pertaining to the data we collected and captured from the QA activities for the 2010 CCM IL operation. The methods that we used to analyze the data from the Initial Observation of listers and DQC listers, Office Edit and DQC Office Edit, and the DQC are presented in Section 2, Methodology, of this report. The assumptions and limitations underlying the analyses are presented in Section 3, Limitations. The summary statistics are presented in Section 4, Results. In Section 5, Conclusions and Recommendations, we present a summary of the findings and provide recommendations to improve the CCM IL and IL QA program.

2. METHODOLOGY

The summary statistics presented in this report are based on our analysis of data from two sources, the Observation Checklists and the data file for Sections 1-3 of the ILB.

2.1. *Observation Checklists, Form D-1222(CCM-IL) and Form D-1222(CCM-IL)(PR)* (See Appendix B)

After receiving the completed Observation Checklists from the RCCs and PRAO, the NPC keyed each form. There were 3,229 Observation Checklists that the NPC received and keyed. The keying of the checklists underwent 100-percent independent verification in the NPC using their standard "QA Plan for the Visual Basic Data Entry Operation and Keying QA Procedures."[5] An output file containing the data was then sent to headquarters (HQ) for our analysis. After removing forms with duplicate data, there were 3,186 Observation Checklists. This number is used throughout this report when discussing the total number of Observation Checklists.

2.2. *Data File – Sections 1 - 3 of Independent Listing Book* (See Appendix C)

The RCCs and PRAO sent the completed ILBs to the NPC where they were keyed. The NPC keyed the ILBs for 12,364 block clusters. Again, the keying of the ILBs underwent 100-percent independent verification in the NPC using their standard "QA Plan for the Visual Basic Data Entry Operation and Keying QA Procedures."[6] After keying and verification, the output file was delivered to the DSSD Census Evaluation and Experimentation (CEE) System for our analysis.

2.3. *Error Rate Estimation*

Below is a brief description of the incoming and outgoing error rate estimates that are reported in the Results section and how each estimate was calculated.

2.3.1. *Incoming Sample Error Rate*

The incoming sample error rate (ISER) is the estimate of the error rate of the sampled Section 4 listings before correction. It is the weighted average of the error rates over all block clusters or the number of Section 4 BSA listings with one or more errors divided by the number of Section 4 BSA listings in the DQC per block cluster, weighted and summed over all block clusters. The following formulas were used in calculating the incoming sample error rate and its variance:

[5] The Weekly Data Keying Verification Reports, illustrated in Appendix E, showed that 0.6 percent of fields on the Observation Checklists were keyed in error.

[6] The Weekly Data Keying Verification Reports, illustrated in Appendix E, showed that 0.9 percent of fields in the ILBs were keyed in error.

$$ISER = \sum_{i=1}^{M}\left(\frac{N_i}{N}\right)\left(\frac{x_i}{n_i}\right) \qquad Var(ISER) = \frac{1}{N^2}\sum_{i=1}^{M}\left(\frac{N_i^2}{n_i}\right)\left(\frac{x_i}{n_i}\right)(1-\frac{x_i}{n_i})$$, where

M = number of block clusters in the initial CCM sample
N_i = number of estimated Section 4 BSA listings in block cluster i
N = the total number of estimated Section 4 listings listed in M block clusters
n_i = number of Section 4 listings selected for DQC in block cluster i
x_i = number of Section 4 BSA listings found to have errors in the DQC in block cluster i

2.3.2. *Outgoing Error Rate*

The outgoing error rate (OER) is the estimate of the error rate after all QC corrections (DQC and rectification).

For block clusters that failed the DQC, we are assuming there are no errors remaining in the block clusters after the rectification is completed, because we assume the DQC listers' rectification is perfect.

For block clusters that passed, there are two groups, 1) Section 4 BSA listings in the DQC that were checked and corrected and 2) Section 4 BSA listings that were not checked at all. The second group's errors have to be estimated, since they were not checked. The bias is in the assumption that the error rate of the unchecked portion of the block cluster would match the error rate of the DQC sample. The following formulas were used in calculating the biased estimates of outgoing error rate and its variance:

$$OER = \frac{\sum_{i=1}^{M}(N_i - n_i)\left(\frac{x_i}{n_i}\right)}{\sum_{i=1}^{M} N_i} \qquad Var(OER) = \frac{1}{N^2}\sum_{i=1}^{M}\left(\frac{(N_i - n_i)^2}{n_i}\right)\left(\frac{x_i}{n_i}\right)\left(1-\left(\frac{x_i}{n_i}\right)\right)$$

3. LIMITATIONS

This section discusses the assumptions and limitations for this report.

3.1. *Data from the Observation Checklists*

During the analysis of the data, we found that several Observation Checklists were duplicates of other keyed checklists. We removed the records for the forms with duplicate data for our analysis.

We also found that many of the forms were not filled out completely, that is, CLs or QC CLs:

- Did not record the Field Representative (FR) code of the crew member being observed on 395 forms (12.2 percent). This occurred on 11.9 percent of the U.S. forms and 17.8 percent of forms from Puerto Rico.
- Did not record a result of the observation on 131 forms (4.1 percent).

Because the FR codes for many listers/DQC listers were missing from the Observation Checklists, we assumed that the checklists with missing FR codes were for unique crew members who did not have another Observation Checklist filled.

To get an estimate of crew members that were observed, we added the number of unique FR codes recorded on the checklists to the number of forms with no FR code recorded. This estimate is used when discussing the coverage of the Initial Observation in the Results section.

There were several keyed checklists that were duplicates of other checklists. These duplicates were removed during this analysis, but there still could be mulitple checklists with differing data for a single crew member that remained in our analysis.

By examining whether Section A, for listers, or Section B, for DQC listers, was completed on the Observation Checklist, we can better estimate the number of forms for each type of crew member. We found this to be a more accurate breakdown of the forms than relying on the number of forms that were marked as “Production” or “DQC” in Identification Items, 2. Type of observation, on the Observation Checklist.

3.2. *Data from the Independent Listing Books*

The data file showed that not all ILBs had Sections 1 – 3 filled out completely.

On the cover of the ILB, the office staff/crew members did not record:

- The number of lines used in Section 4 of all ILBs for the cluster (Section 1 – Identification, item 11) for 25 block clusters (0.2 percent).

- The DQC random start number (Section 1 – Identification, item 12) for 22 block clusters (0.2 percent).
- The FR code for at least one lister who performed the work (Section 2 – Assignment Information, items 2 or 3) for 325 block clusters (2.6 percent).
- The FR code for at least one DQC lister who performed the work (Section 2 – Assignment Information, items 5 or 6) for 339 block clusters (2.7 percent).

In the Office Edit sub-sections of the ILB (Section 3 – Quality Assurance, item 1. Listing Office Edit and item 6. DQC Office Edit):

- The office staff did not record the Listing office edit result for 126 block clusters (1.0 percent).
- The office staff did not record the DQC office edit result for 347 block clusters (2.8 percent).

In the DQC Office Staff sub-section of the ILB (Section 3 – Quality Assurance, item 2. DQC Office Staff), the office staff did not record:

- "Start DQC in book" for 290 block clusters (2.3 percent).
- "Start DQC…on line number" for 261 block clusters (2.1 percent).

In the DQC Result sub-section of the ILB (Section 3 – Quality Assurance, item 4. DQC Result), the DQC lister failed to record the DQC Result for 45 block clusters (0.4 percent).

In addition to incomplete information in Sections 1 – 3 of the ILB, there were several times that the sections were filled out incorrectly. For instance, if a block cluster contained no living quarters, listers were to list each block in Section 4 with the remark "No Living Quarters." In this situation, Section 1, item 11, "Number of lines used in Section 4 of all books for cluster" should have been equal to the number of blocks in the block cluster. Therefore, even when there were no living quarters in a block cluster, item 11, "Number of lines used in Section 4…" should always have a value of one or greater. However, 63 block clusters had a blank or "0" entry.

Since at least one line in the ILB should have been completed for each block cluster, even those with no living quarters, the documentation of the DQC should have contained at least one line filled in the DQC Lister sub-section of Section 3. Although this was what was supposed to be done, the lines in the DQC Lister sub-section were left blank for 33 block clusters (29 of these block clusters also had zero HUs recorded on the cover of the ILB).

To estimate the total number of listers/DQC listers who performed work, we did the following:

- If there was only one lister recorded in Section 2 of the ILB, we assumed that lister did the work.

- If there were two listers recorded, we assumed that the second lister did the work.
- We followed the same procedure for the DQC listers recorded in Section 2 of the ILB.

The FR codes for many listers/DQC listers were missing from Section 2 of the ILB. When multiple ILBs were used to list the block cluster, we analyzed only the book with the DQC data recorded. The FR code could have been recorded in another book. This could have led us to not see the FR codes recorded for some of the block clusters. Because so many of the FR codes were missing, we assumed that any block cluster with no FR code recorded for a lister was completed by a lister whose FR code was recorded for another block cluster. Similarly, we assumed that any block cluster with no FR code recorded for a DQC lister was completed by a DQC lister whose FR code was recorded for another block cluster. The result may be an undercount in the total number of listers/DQC listers who completed work.

The "Number of lines used in Section 4 of all ILBs for cluster" from Section 1, item 11 of the ILB provided an estimate of BSA listings recorded in Section 4 of the ILB during IL. This item was unedited, but provided a sufficient estimate for the number of Section 4 BSA listings and is used throughout this report when discussing the results of the DQC. Each listing in Section 4 – Listing Page of the ILB represents the BSA of 1) a single-family house, 2) a multiunit, 3) a mobile home/trailer not in a park, 4) a park office for a mobile home/trailer in a park, or 5) a HU not covered above, such as a tent or camper.

The "Total number of HUs listed in the cluster" from Section 1, item 10 of the ILB provided an estimate of HUs recorded in the ILBs. This item was unedited, but provided a sufficient estimate for the total number of HUs listed and is used in this report when discussing rectification results.

All 12,364 block clusters in the initial CCM sample were supposed to be checked under the DQC. However, 33 block clusters had no data entered in Section 3 – Quality Assurance of the ILB for the sample string. Twenty-nine of the 33 block clusters that had no data entered for the DQC were those that had zero housing units recorded in Section 1, item 10 of the ILB. This omission of DQC data was most likely the result of confusion on how to fill out Section 3 when the block cluster contained no living quarters. For the purpose of our analysis, block clusters with no living quarters recorded in Section 1 and zero lines filled in the DQC Lister sub-section of Section 3 of the ILB were considered to have a correct DQC sample size.

The keyed DQC Result on the output file should have been only "Pass" or "Fail." If an ILB was marked as "Fail/Redo," it should have gone back to the field for a "Redo" listing, continuing this cycle until either "Pass" or "Fail" was marked for the DQC. Those block clusters for which we received a final result of "Fail/Redo" are counted in the number of block clusters that failed the DQC in our analysis.

There were 32 block clusters that had data in "Number of lines used in Section 4 of all books for cluster" in Section 1 of the ILB that did not have any lines filled in the DQC Lister sub-section. Using these block clusters would skew the rate of BSA listings in Section 4 with one or more critical errors. When determining the estimated incoming and outgoing error rates, we included only block clusters with lines filled in the DQC Lister sub-section and data for "Number of lines used in Section 4."

4. RESULTS

4.1. Initial Observation Results

The purpose of the Initial Observation was to ensure that the listers and DQC listers had a good understanding of their jobs and the listing procedures. As soon as possible after training was completed, the CLs and QC CLs were supposed to accompany each lister and DQC lister while he or she was listing their block cluster or performing the DQC.

4.1.1 Initial Observation Coverage

We estimated that there were 3,045 unique crew members with an Observation Checklist keyed. From examining whether Section A was filled (listers) or Section B was filled (DQC listers), there were 2,338 forms for listers, 699 for DQC listers, and 8 that had neither section filled.

Table 1 illustrates the coverage of the Initial Observation based on the data from Section 2 – Assignment Information of the ILB and the Observation Checklists. There was a minimum of 3,685 total crew members that performed work in one or more block clusters. While every crew member that was assigned work should have been observed by the CL/QC CL, the Observation Checklists indicate that 87.1 percent of the number of unique listers recorded in Section 2 of the ILB was observed, while only 69.8 percent of the number of unique DQC listers recorded in Section 2 was observed. Overall, only 82.6 percent of the estimated number of crew members was observed. The breakdown of Initial Observation coverage by RCC/PRAO can be seen in Table 1A in Appendix A.

Table 1: Initial Observation Coverage by Role

Role	Estimated Crew Members	Estimated Crew Members Observed	
		Count	%
Lister	2,683	2,338	87.1
DQC Lister	1,002	699	69.8
Unknown	-	8	-
TOTAL	**3,685**	**3,045**	**82.6**

Data Source: Forms D-1222(CCM-IL), Observation Checklist and Section 2 of D-1302, CCM ILB.

4.1.2 Final Outcome of the Initial Observation

The majority (93.2 percent) of all crew members observed during the Initial Observation had a result of "Satisfactory." About four percent of the Observation Checklists had no results recorded. About 95 percent of crew members that we know were listers had a result of "Satisfactory," while about 93 percent of known DQC listers had a "Satisfactory" result. Of the forms with no data recorded in Section A or B, 67.4 percent had a result of "Other." This most likely means that the crew member resigned before an observation could be conducted and the observer simply marked the result, leaving the evaluation of the tasks listed in Section A or B blank. Also, only one result should have been marked on each form, so checklists with multiple results marked or those with no result marked are procedural errors by the CL/QC CL. Table 2, below, summarizes the observation outcomes and Table 2A in Appendix A, illustrates these outcomes by RCC/PRAO.

Analyzing only the Observation Checklists with data in Section A, for listers, or Section B, for DQC listers, we discovered that only about four percent of the crew members were observed a second time. A second observation occurred after additional training when the crew member had an unsatisfactory first observation. Table 3, below, shows the number of observations recorded on the checklists with data in Section A or Section B. Table 3A in Appendix A has this information by RCC/PRAO.

Table 2: Final Results from Observation Checklists by Role

Outcome		
Listers	Count	%
Satisfactory	2,297	94.8
Unsatisfactory	32	1.3
Other	13	0.5
Multiple*	2	0.1
Missing*	79	3.3
Sub-total	**2,423**	**100.0**
DQC Listers	Count	%
Satisfactory	665	92.8
Unsatisfactory	6	0.8
Other	2	0.3
Multiple*	-	-
Missing*	44	6.1
Sub-total	**717**	**100.0**
Unknown*	Count	%
Satisfactory	6	13.0
Unsatisfactory	1	2.2
Other	31	67.4
Multiple*	-	-
Missing*	8	17.4
Sub-total	**46**	**100.0**
All Roles	Count	%
Satisfactory	2,968	93.2
Unsatisfactory	39	1.2
Other	46	1.4
Multiple*	2	0.1
Missing*	131	4.1
TOTAL	**3,186**	**100.0**

Data Source: Form D-1222(CCM-IL), Observation Checklist.
** Procedural error*

Table 3: Number of Observations Recorded on Observation Checklists*

	1st Obs. Only		2nd Obs.		Total
	Count	%	Count	%	Count
Listers	2,315	95.5	108	4.5	2,423
DQC Listers	696	97.1	21	2.9	717
TOTAL	**3,011**	**95.9**	**129**	**4.1**	**3,140**

Data Source: Form D-1222(CCM-IL), Observation Checklist.
** Includes only the checklists with data recorded in Section A for listers or Section B for DQC listers*

4.1.3. Summary of Errors Committed by Listers and DQC Listers During Initial Observation

Table 4 below presents a summary of errors reported by the CLs during the Initial Observation of the listers. There were a total of 454 errors reported on the Observation Checklist forms for listers. The three lister tasks that were performed incorrectly the most dealt with recording complete information about each housing unit in the appropriate section(s) of the ILB (15.9 percent), providing

each respondent with the Privacy Act Notice (11.2 percent), and map spotting each BSA containing housing units (11.2 percent).

Table 5 shows that the QC CLs reported 98 errors while observing the DQC listers. The three DQC lister tasks that were performed incorrectly the most dealt with following the proper procedures when the lister listed the wrong block (27.6 percent), rectifying the entire block cluster if it failed the DQC (14.3 percent), and recording the results of the DQC in the ILB (12.2 percent). Table 4A and Table 5A in Appendix A show the distributions of these errors by RCC/PRAO.

Table 4: Distribution of Tasks Performed Incorrectly during Observation - Listers

Tasks listers failed to perform correctly	1st Obs.		2nd Obs.		Total	
I. Canvassing	Count	%	Count	%	Count	%
1. Traveled through the assigned block cluster and looked for housing units	17	4.0	1	3.1	18	4.0
II. Listing						
2. Listed correct block(s) in the block cluster	27	6.4	2	6.3	29	6.4
3. Checked for additional housing units at every basic street address (BSA)	22	5.2	2	6.3	24	5.3
4. Attempted to conduct a brief interview at every BSA	16	3.8	1	3.1	17	3.7
5. Contacted or attempted to contact a resident manager, superintendent, or other knowledgeable person at a multi-unit structure about the housing units in the multiunit	34	8.1	1	3.1	35	7.7
6. Contacted or attempted to contact an owner, manager, or other knowledgeable person at a mobile home or trailer park about the mobile home(s)/trailer(s) and/or empty lot(s)/site(s) in the park	34	8.1	1	3.1	35	7.7
7. Showed Census identification and used appropriate introduction at each BSA	35	8.3	3	9.4	38	8.4
8. Provided a copy of the Privacy Act Notice to each respondent	50	11.8	1	3.1	51	11.2
9. Recorded complete information about each housing unit in appropriate section of the ILB	67	15.9	5	15.6	72	15.9
III. Map spotting on CCM Block Maps						
10. Marked the location of each BSA containing HUs listed in Section 4 and each mobile home/trailer or empty lot/site listed in Section 6 with a map spot and map-spot number	45	10.7	6	18.8	51	11.2
11. Made corrections and/or updates to street features on the map	33	7.8	5	15.6	38	8.4
12. Entered the correct number of apartments listed in Section 5 in parentheses next to the map-spot number for a multi-unit structure	42	10.0	4	12.5	46	10.1
Total	**422**	**100.0**	**32**	**100.0**	**454***	**100.0**

* Based on 2,423 Observation Checklists with data recorded for listers

Data Source: Form D-1222(CCM-IL), Observation Checklist.

Table 5: Distribution of Tasks Performed Incorrectly during Observation – DQC Listers

Tasks DQC listers failed to perform correctly	1st Obs.		2nd Obs.		Total	
DQC Verification	Count	%	Count	%	Count	%
1. Started DQC in correct block at correct BSA for line number in ILB designated as the random start	3	3.4	-	-	3	3.1
2. Checked correct block(s)	2	2.3	-	-	2	2.0
3. Listing on random start number and next 11 lines in the ILB are outside the block cluster – Marked the block cluster as "Fail/Redo" in Section 3 of the ILB and returned the ILB and maps to the QC Crew Leader or QC Crew Leader Assistant	25	28.4	2	20.0	27	27.6
4. Performed the DQC by verifying the proper listing and map spotting of the BSAs in the sample string	6	6.8	-	-	6	6.1
5. Recorded the results of the DQC in Section 3 of the ILB	10	11.4	2	20.0	12	12.2
6. If block cluster failed DQC – Rectified the block cluster by verifying the proper listing and map spotting of all remaining housing units on the ground in the block cluster	12	13.6	2	20.0	14	14.3
7. Recorded the results of the rectification in Section 3 of the ILB	9	10.2	2	20.0	11	11.2
8. Corrected each error detected by correcting missing/incorrect address items, adding missing housing units, or deleting erroneously listed housing units or nonresidential units in the ILB	3	3.4	1	10.0	4	4.1
9. Corrected erroneous or missing map spots and/or map-spot numbers on the CCM Block Map(s) for the block cluster	8	9.1	1	10.0	9	9.2
10. Fixed critical errors identified by the office edit	7	8.0	-	-	7	7.1
11. Verified street feature updates to the map(s)	3	3.4	-	-	3	3.1
Total	**88**	**100.0**	**10**	**100.0**	**98***	**100.0**

* Based on 717 Observation Checklists with data recorded for DQC listers

Data Source: Form D-1222(CCM-IL), Observation Checklist.

4.2. Office Edit Results

The purpose of the listing and DQC office edits was to ensure that the listings in the ILBs were complete and properly map spotted on the CCM block cluster maps and that Section 3 of the ILB was completed for the DQC. Each block cluster listed during IL required an office edit after production listing and another office edit after the DQC.

According to the data recorded and keyed from the Listing Office Edit and DQC Office Edit sub-sections in Section 3 of the ILB, 90.7 percent of block clusters passed the listing office edit and 96.7 percent of the block clusters passed the DQC office edit. No result was marked for the listing office edit on 1.0 percent of block clusters and 2.8 percent of block clusters had no result marked for the DQC office edit. Table 6 and Table 7, below, summarize the office edit outcomes from Section 3 of the ILB. Similar results by RCC/PRAO can be found in Table 6A and Table 7A in Appendix A.

Table 6: Listing Office Edit Results

Pass		Fail		Multiple*		Blank*		Total
#	%	#	%	#	%	#	%	#
11,217	90.7	1,015	8.2	6	0.1	126	1.0	12,364

Data Source: Section 3, item 1. Listing Office Edit of Form D-1302, CCM ILB.
** Procedural error*

Table 7: Dependent Quality Check Office Edit Results

Pass		Fail*		Multiple*		Blank*		**T**otal
#	%	#	%	#	%	#	%	#
11,950	96.7	50	0.4	17	0.1	347	2.8	12,364

Data Source: Section 3, item 6. DQC Office Edit of Form D-1302, CCM ILB.
****** *Procedural error*

4.3. Dependent Quality Check Results From Section 3 of the ILB

Once a lister completed listing a block cluster and it passed the CL Edit, the CL returned the work to the RCC/PRAO. After the listing office edit, every block cluster was supposed to undergo a DQC. The DQC sample for each block cluster was to be a random string of consecutive BSAs on the ground that contained or represented one or more HUs. If a block cluster contained fewer than 12 BSAs, the DQC sample was to include all BSAs in the block cluster.

The 12,364 block clusters with ILBs that were keyed in the NPC were either an Initial listing or a Redo listing. A Redo listing was to occur when the initial DQC discovered that neither the BSA indicated as the starting point for the DQC nor any of the BSAs on the next 11 lines in Section 4 of the ILB represented HUs in the block cluster. As seen in Table 8, below, only 0.3 percent of the block clusters were marked as a Redo. However, since the Initial Observation results show that the DQC listers had difficulty with the task of following the proper procedures when the lister listed the wrong block cluster, this 0.3 percent rate may be an underestimate of the amount of Redo listings that should have been done. Table 8A, in Appendix A, illustrates the type of listing by RCC/PRAO.

Table 8: Type of Listing

Initial		Redo		Total
#	%	#	%	#
12,333	99.8	31	0.3	12,364

Data Source: Section 1 of Form D-1302, CCM ILB.

4.3.1. DQC Result

The ILB(s) for each block cluster in IL should have had a DQC result recorded. At the end of the operation, when the ILBs were keyed in NPC, the ILB(s) for a

block cluster should have had only "Pass" or "Fail" marked in Section 3 because the third choice, "Fail/Redo," is not a final DQC result. If the initial DQC result was "Fail/Redo," the ILB(s) should have gone back out to the field to be redone in production. When the reworked ILB(s) came back in, a DQC lister should have performed another DQC and recorded that DQC result. However, there were six block clusters (0.1 percent) with a final result of "Fail/Redo," ten block clusters (0.1 percent) with multiple DQC results boxes marked, and 45 block clusters (0.4 percent) with no DQC result marked. Table 9 shows the results of the DQC for the 12,364 block clusters with keyed ILBs and Table 9A in Appendix A illustrates these DQC results by RCC/PRAO.

Table 9: Dependent Quality Check Results

Pass		Fail		Fail/Redo*		Multiple*		Blank*		Total
#	%	#	%	#	%	#	%	#	%	#
9,907	80.1	2,396	19.4	6	0.1	10	0.1	45	0.4	12,364

Data Source: Section 3, item 4. DQC Result of Form D-1302, CCM ILB.

***** *Procedural error*

Considering a final "Fail/Redo" result as a "Fail," Table 9.1 presents the frequency of listers by the number of block clusters that failed the DQC. Of the 2,683 listers that performed work, 49.9 percent failed the DQC at least once. More specifically, 28.3 percent of the listers had only one block cluster fail the DQC and 12.9 percent had only two of their block clusters fail the DQC.

Table 9.1: Frequency of Listers by Number of Failed Clusters

# of Failed Clusters *n*	# of Listers with *n* Failed Clusters	% of Total Listers (2,683)
1	760	28.3
2	346	12.9
3	113	4.2
4	63	2.3
5	23	0.9
6	14	0.5
7	10	0.4
8	3	0.1
9	1	0.0
10	2	0.1
11	1	0.0
13	2	0.1
Total	**1,338**	**49.9**

Data Source: Section 2 and Section 3, item 4. DQC Result of Form D-1302, CCM ILB.

Table 10 shows the count and percent of total block clusters that had a DQC result of "Fail" or "Fail/Redo," as well as the count and percent of block clusters that should have been marked failed, i.e., there was one or more critical errors detected and recorded in Section 3 of the ILB. The percent of block clusters that had a DQC result of "Fail" or "Fail/Redo" was 19.4 percent, compared to 19.8 percent of block clusters that should have been marked as "Fail." The comparable fail rate (block clusters with a final DQC result of either "Fail" or "Fail/Redo") from the 2008 Dress Rehearsal was 19.8 percent, as reported in our 2008 IL Quality Profile (Cecchi, 2009). In Appendix A, Table 10A shows the 2010 DQC fail rates by RCC/PRAO.

Table 10: Dependent Quality Check Fail Rate Discrepancies

Total	Block Clusters That Had a Result of Fail or Fail/Redo		Block Clusters That Should Have Failed*	
Count	Count	%	Count	%
12,364	2,402	19.4	2,449	19.8

Data Source: Section 3, item 3. DQC Lister and item 4. DQC Result of Form D-1302, CCM ILB.
* Block clusters with one or more critical errors recorded in Section 3 of ILB

4.3.2. DQC Sample Size

For statistical purposes, the CMOCS randomly selected the starting BSA for the DQC. As mentioned above, a block cluster's DQC sample was supposed to be a random string of BSAs on the ground that contained or represented one or more

HUs. If a block cluster contained less than 12 BSAs for HUs, then the DQC sample was to include all BSAs in the block cluster.

Table 11 illustrates how correct the DQC sample size was for all block clusters. Based on the number of lines the DQC lister filled in the DQC Lister sub-section of Section 3 of the ILB, the DQC sample size (number of listings in Section 4 of the ILB checked in the DQC) was correct for 97.0 percent of the block clusters. In comparison, 89 percent of the block clusters had correct sample size in the 2008 Dress Rehearsal (Cecchi,2009). Table 11A in Appendix A shows the number of block clusters with the correct sample size by RCC/PRAO.

In these tables, block clusters that have zero lines checked in the DQC and zero HUs listed in Section 1, item 10, of the ILB were considered as clusters having an acceptable DQC sample size.

Table 11: Block Clusters with Correct Sample Size Recorded

Total Block Clusters	Block Clusters with Correct Sample Size	
Count	Count	%
12,364	11,987	97.0

Data Source: Section 3, item 3. DQC Lister of Form D-1302, CCM ILB

4.3.3. Summary of Errors Detected and Corrections Made in the Dependent Quality Check

Table 12 below summarizes the critical errors found in the listers' work during the DQC. More than half (55.1 percent) of the critical errors detected (7,526) were instances where the DQC lister corrected a BSA's map spot number, type of unit, unit status, or address information. This type of error was found in approximately 12 percent (1,516/12,364) of all block clusters. The second most frequent critical error detected was DQC listers having to add BSAs to Section 4 of the ILB that listers missed (15.3 percent, found in approximately five percent of all block clusters), followed by DQC listers having to delete BSAs from Section 4 that listers erroneously listed (13.8 percent, found in approximately three percent of all block clusters). Table 12A in Appendix A illustrates this DQC error summary by RCC/PRAO.

Table 12: Critical Errors Detected and Corrections Made during the Dependent Quality Check

*Column in Section 3 of the ILB																		
3		**4**		**5**		**6**		**7**		**8**		**9**		**10**		**11**		**Total**
#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
1,152	15.3	1,038	13.8	4,148	55.1	356	4.7	289	3.8	364	4.8	52	0.7	19	0.3	108	1.4	7,526

Data Source: Section 3, 3. DQC Lister of Form D-1302, CCM ILB.

*Column #	Description of Type of Correction Made by the DQC Lister
3	Section 4 – Added a BSA
4	Section 4 – Deleted a BSA
5	Section 4 – Corrected a BSA's • Map Spot No. • Type of unit • Unit status • Address
6	Section 5 – Added one or more units
7	Section 5 – Deleted one or more units
8	Section 5 – Corrected one or more of the following: • Unit designation • Unit status
9	Section 6 – Added one or more units/sites
10	Section 6 – Deleted one or more units/sites
11	Section 6 – Corrected one or more of the following: • Map Spot No. • Unit status • Address

4.3.4. DQC Workload

By using the number of lines used in Section 4 of the ILB for all books for the cluster, as entered in Section 1, item 11, of the ILB, we can get an estimate of the total number of BSA listings entered in Section 4. By using this method, there was an estimated number of 581,473 listings in Section 4 of the ILB listed over 12,364 block clusters. By counting the number of lines checked in the DQC (lines filled in the DQC Lister sub-section of Section 3 of the ILB), we can compute an estimate of the DQC sampling rate. The DQC sampling rate shows that 19.2 percent of the total number of listings in Section 4 were checked in the DQC. Note: We had an estimated sampling rate of 15.8 percent in our Quality Assurance Plan (Cecchi, 2008).

If we assume that all block clusters that had a DQC result of "Fail" or "Fail/Redo" were correctly rectified, after the DQC and rectification, 32.0 percent of the Section 4 listings were checked. This rate increases to 32.5 percent of Section 4 listings, if we assume that all block clusters that had one or more critical errors recorded in Section 3 of the ILB were correctly rectified. Table 13 shows the DQC sample workload, along with the total verification workloads after rectification, in greater detail. Table 13A, in Appendix A, shows these DQC and total verification workloads by RCC/PRAO.

Table 13: Dependent Quality Check and Total Verification Workloads

Estimated # of Section 4 Listings	# of Section 4 Listings in DQC sample	DQC Sampling Rate	Clusters With Result of Fail or Fail/Redo			Clusters That Should Have Failed*		
			Estimated # of Section 4 Listings Rectified	Estimated # of Section 4 Listings Checked**	% of Estimated Section 4 Listings Checked	Estimated # of Section 4 Listings Rectified	Estimated # of Section 4 Listings Checked**	% of Estimated Section 4 Listings Checked
581,473	111,773	19.2	74,512	186,285	32.0	77,342	189,115	32.5

Data Source: Section 1, item 11; Section 3, item 3. DQC Lister and item 4. DQC Result of Form D-1302, CCM ILB

* Block clusters with one or more critical errors recorded in Section 3 of the ILB

** DQC sample + rectification

4.3.5 Rectification Results

A block cluster should have been rectified if it failed the DQC. As illustrated in Table 10 above, of the 12,364 block clusters listed, there were 2,449 block clusters that had critical errors recorded in the DQC sub-section in Section 3 of the ILB. Therefore, there should have been 2,449 block clusters rectified. However, 2,473 block clusters contained data in the Rectification sub-section of Section 3 of the ILB. Of the 2,449 block clusters that should have been marked as "Fail" in the DQC result, 95.2 percent had data in the Rectification sub-section. The remaining 4.8 percent of the block clusters that should have been marked as "Fail" did not have totals recorded in the Rectification sub-section. Conversely, 1.4 percent of the block clusters with no critical errors recorded in the DQC Sub-section of the ILB had results recorded in the Rectification sub-section.

The rectification results show that the DQC listers added 6,094 units (0.7 percent of total estimated HUs) that the listers missed, deleted 5,185 units (0.6 percent of total estimated HUs) that were not HUs that the listers listed, and corrected the addresses of 17,762 listed units (two percent of total estimated HUs). These counts may not be accurate because the procedures for rectification indicated that DQC listers were to record the number of units in these columns in the Rectification sub-section of the ILB. The word "addresses" printed in this section may have caused some DQC listers to record counts of BSAs instead of HUs rectified. The summary of block clusters rectified is represented in Table 14, while the rectification totals of the types of corrections made are shown in Table 15. The breakdown by RCC/PRAO of each of these tables can be seen in Table 14A and Table 15A in Appendix A.

Table 14: DQC Results Versus Rectification Data

DQC	Total Clusters	Clusters with Rectification Data	
		#	%
No Critical Errors Recorded	9,915	141	1.4
Critical Errors Recorded	2,449	2,332	95.2
Total	**12,364**	**2,473**	**20.0**

Data Source: Section 3, item 5. Rectification of Form D-1302, CCM ILB

Table 15: Rectification Corrections

Type of Correction	Count	% of Total Estimated HUs (889,577)*
Addresses Added	6,094	0.7
Addresses Deleted	5,185	0.6
Addresses Corrected	17,762	2.0

Data Source: Section 3, item 5. Rectification of Form D-1302, CCM ILB

* From Section 1, item 10 of Form 1302, CCM ILB

4.3.6. Incoming and Outgoing Error Rates

The incoming error rate was calculated by taking the sum of the weighted estimates of Section 4 BSA listings in error in all block clusters with lines filled in the DQC Lister sub-section of Section 3 of the ILB and dividing that by the total estimate of listings in Section 4 of the ILB in those block clusters. After this calculation, the incoming error rate shows that 5.27 percent of the total number of Section 4 BSA listings contained critical errors (with a 90 percent confidence interval of 5.17 percent, 5.36 percent).

Per our QA Plan, the outgoing error rate should have been zero percent (Cecchi, 2008). When a DQC lister discovered any critical error during the DQC, they were to rectify the entire cluster by checking from ground to book the listing of all housing units remaining in the block cluster. However, based on what was recorded in the ILBs, we are not sure if all block clusters with critical errors were correctly rectified. Therefore, the outgoing error rate could have been greater than zero percent.

To compensate for the possibility of an outgoing error rate greater than zero percent, we assume that the entire block cluster was properly rectified if the cluster had the following information recorded:

- One or more critical errors recorded in Section 3 of the ILB and
- Either Rectification data recorded in the ILB or 12 or less total lines used in Section 4 of the ILB.

By analyzing the block clusters with one or more critical errors recorded, no rectification data recorded, and more than 12 lines used in Section 4, we can find the greatest possible number of BSA listings in Section 4 of the ILB that remained in error after the DQC and rectification. This outgoing error rate was calculated by taking the sum of the weighted estimates of the Section 4 listings in error that were not checked during the DQC for these block clusters and dividing that by the total estimate of the Section 4 BSA listings for these block clusters. After this calculation, the outgoing error rate shows that, at most, 0.15 percent of the total BSA listings in Section 4 of the ILB remained in error (with a 90 percent confidence interval of 0.06 percent, 0.24 percent). This outgoing error rate is well below the desired average outgoing quality limit of 3.0 percent set forth in our QA Plan (Cecchi, 2008).

5. CONCLUSIONS AND RECOMMENDATIONS

In this section, we summarize the results of the QA activities and provide recommendations for improving the IL and IL QA program.

5.1 *Conclusions*

Every lister and DQC lister should have undergone Initial Observation. However, only 82.6 percent of crew members were observed.

The majority of the observed crew members (93.2 percent) had a final result of "Satisfactory" during the Initial Observation. The task performed incorrectly most often by the listers during the observation was recording complete information about each housing unit in the appropriate section of the ILB (15.9 percent). The task that DQC listers performed incorrectly most often during the observation was following the proper procedures when the lister listed the wrong block (27.6 percent).

According to the results from the Office Edit sub-sections in Section 3 of the ILB, 90.7 percent of the block clusters had a Listing office edit result of "Pass" and 1.1 percent of the block clusters had either no result marked or both "Pass" and "Fail" marked. The remaining block clusters had a Listing office edit result of "Fail." For the DQC office edit, 96.7 percent had a result of "Pass" and 2.9 percent of the block clusters had either no result marked or both "Pass" and "Fail" marked. The remaining block clusters had a DQC office edit result of "Fail."

The DQC listers determined that the listers listed the wrong block cluster, marked the ILB(s) as a "Redo," and returned the ILB(s) to be redone in production on only 0.3 percent of the block clusters. Because 27.6 percent of the tasks performed incorrectly by the DQC listers during Initial Observation dealt with following the proper procedures when the lister listed the wrong block cluster, the percent of block clusters that should have actually been redone in production because the lister listed the wrong block cluster could have been greater than 0.3 percent.

About 80 percent of the block clusters had a DQC result of "Pass" recorded in Section 3 of the ILB and about 19 percent had a DQC result of "Fail." Less than one percent of the block clusters showed procedural errors in how the DQC result was recorded (multiple results marked, no result marked, "Fail/Redo" marked as a final result).

Of the 2,683 listers that performed work, 49.9 percent failed the DQC at least once. More specifically, 28.3 percent of the listers had only one block cluster fail the DQC and 12.9 percent had only two of their block clusters fail the DQC.

The percent of block clusters with a DQC result of "Fail" or "Fail/Redo" was 19.4 percent, while 19.8 percent of block clusters had one or more critical errors recorded in Section 3 of the ILBs, thereby procedurally requiring a DQC result of "Fail."

About 97 percent of the block clusters were correctly sampled in the DQC.

The majority of all critical errors detected during the DQC (55.1 percent, found in approximately 12 percent of all block clusters) showed that the DQC listers corrected a basic street address's map spot number, type of housing unit, unit status, or address information in Section 4 – Listing Page of the ILB. The second most frequent critical error detected was DQC listers having to add BSAs to Section 4 of the ILB that listers missed (15.3 percent, found in approximately five percent of all block clusters), followed by DQC listers having to delete BSAs from Section 4 that listers erroneously listed (13.8 percent, found in approximately three percent of all block clusters).

There was an estimated total of 581,473 BSA listings in Section 4 of the ILBs over all block clusters, with 19.2 percent of these listings being checked during the DQC. Our QA Plan estimated a 15.8 percent sample (Cecchi, 2008). A total of 32.5 percent of the Section 4 BSA listings were checked by the DQC listers after rectification. This was determined by analyzing the number of listings in Section 4 checked during the DQC for all block clusters plus the additional number of listings that should have been checked during rectification for block clusters with one or more critical errors recorded in Section 3 of the ILB.

Of the total number of block clusters, 20.0 percent contained rectification data in Section 3 of the ILB. Most of the block clusters with critical errors recorded in Section 3 (95.2 percent) had rectification data recorded.

From the rectification data entered in Section 3 of the ILB, DQC listers added a total of 6,094 units that the listers missed (0.7 percent of total estimated HUs), deleted 5,185 non-HUs that the listers listed (0.6 percent of total estimated HUs), and corrected the addresses of 17,762 units that the listers listed (two percent of total estimated HUs).

Of all the BSAs listed in Section 4 of the ILB by the lister, an estimated 5.27 percent were recorded in error (at a 90 percent confidence interval of 5.17 percent, 5.36 percent). Based on the data recorded in Section 3 – Quality Assurance of the ILBs, after the DQC and rectification, we estimate that, at most, 0.15 percent of total BSA listings were uncorrected by the DQC lister, and therefore remained in error (at a 90 percent confidence interval of 0.06 percent, 0.24 percent). This estimated outgoing error rate is well below the desired average outgoing quality limit of 3.0 percent set forth in our QA Plan (Cecchi, 2008).

5.2 Recommendations

We recommend the following actions to improve the CCM IL and IL QA program:

Stress the importance of the (QC) CLs needing to completely fill out the required items on the Observation Checklists. Items such as FR Code, Result, etc., should not be left blank. A quick office edit when these checklists are received by the RCCs and the PRAO might take care of this problem. Ideally, automating the Observation Checklist would be a better solution.

Change the procedures requiring the CLs/QC CLs to complete an Observation Checklist for crew members that are assigned work, but resign before completing any work. The 2010 procedures required the (QC) CL to fill out the identification items of the crew member that resigned, to mark "Other" as the result, and to enter notes explaining that the crew member resigned before completing work. This resulted in unnecessary paperwork.

Determine a better method to ensure that the listers, office editors, DQC listers, and QC office editors completely fill out the required items in the ILBs. Items such as office edit results, total number of lines used in Section 4 of the ILB, information regarding the DQC sample, DQC Result, etc. were frequently left blank.

Emphasize in lister training the importance of recording complete information about each housing unit in the appropriate section of the ILB, as well as map spot number. For DQC listers, more emphasis should be placed on following the correct procedures when the lister listed the incorrect block cluster, along with the rectification of block clusters that fail the DQC.

Emphasize in lister training how to record individual blocks with no living quarters, as well as entire block clusters with no living quarters. The DQC lister training should stress how to perform and document the DQC for those block clusters with no living quarters.

Consider verifying multiple DQC sample strings for large block clusters with more than one ILB, perhaps by selecting a random start number for each ILB. This would increase the chance of the DQC lister discovering critical errors in the listing of the large block cluster.

Consider reducing the size of the DQC sample string from that of 2010, if we decide to verify multiple DQC sample strings in large block clusters, in order to maintain our overall sampling rate.

6. ACKNOWLEDGEMENTS

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7. REFERENCES

Cecchi, Ryan (2008), "Quality Assurance Plan for the 2010 Census Coverage Measurement Independent Listing Field Operation," DSSD 2010 Census Coverage Measurement Memorandum Series, No. 2010-D5-01, U.S. Census Bureau, October 15, 2008.

Cecchi, Ryan (2009), "2008 Census Coverage Measurement Independent Listing Quality Profile," DSSD Census Coverage Measurement Memorandum Series, No. 2008-D5-10, U.S. Census Bureau, November 5, 2009.

Results Tables by Regional Census Centers

Table 1A: Initial Observation Coverage by Role and RCC

Role	Estimated Count	Estimated Crew Members Observed	
		Count	%
Boston			
Listers	156	131	84.0
DQC Listers	58	39	67.2
Unknown	-	5	-
Sub-total	**214**	**175**	**81.8**
New York			
Listers	115	124	107.8
DQC Listers	43	33	76.7
Unknown	-	-	-
Sub-total	**158**	**157**	**99.4**
Philadelphia			
Listers	146	124	84.9
DQC Listers	58	38	65.5
Unknown	-	-	-
Sub-total	**204**	**162**	**79.4**
Detroit			
Listers	209	191	91.4
DQC Listers	64	56	87.5
Unknown	-	1	-
Sub-total	**273**	**248**	**90.8**
Chicago			
Listers	160	146	91.3
DQC Listers	51	36	70.6
Unknown	-	-	-
Sub-total	**211**	**182**	**86.3**
Kansas City			
Listers	155	131	84.5
DQC Listers	82	58	70.7
Unknown	-	-	-
Sub-total	**237**	**189**	**79.7**
Seattle			
Listers	232	194	83.6
DQC Listers	104	57	54.8
Unknown	-	-	-
Sub-total	**336**	**251**	**74.7**
Charlotte			
Listers	250	191	76.4
DQC Listers	69	61	88.4
Unknown	-	-	-
Sub-total	**319**	**252**	**79.0**
Atlanta			
Listers	161	121	75.2
DQC Listers	77	46	59.7
Unknown	-	-	-
Sub-total	**238**	**167**	**70.2**
Dallas			
Listers	283	255	90.1
DQC Listers	125	96	76.8
Unknown	-	1	-
Sub-total	**408**	**352**	**86.3**
Denver			
Listers	362	312	86.2
DQC Listers	152	103	67.8
Unknown	-	-	-
Sub-total	**514**	**415**	**80.7**
Los Angeles			
Listers	282	264	93.6
DQC Listers	77	53	68.8
Unknown	-	-	-
Sub-total	**359**	**317**	**88.3**
Puerto Rico			
Listers	172	154	89.5
DQC Listers	42	23	54.8
Unknown	-	1	-
Sub-total	**214**	**178**	**83.2**
National			
Listers	2,683	2,338	87.1
DQC Listers	1,002	699	69.8
Unknown	-	8	-
TOTAL	**3,685**	**3,045**	**82.6**

Data Source: Forms D-1222(CCM-IL), Observation Checklist and Section 2 of D-1302, CCM ILB.

Table 2A: Final Results from Observation Checklists by RCC and Role*

Outcome	Boston		New York		Philadelphia		Detroit		Chicago		Kansas City		Seattle		Charlotte		Atlanta		Dallas		Denver		Los Angeles		Puerto Rico		**TOTAL**	
Listers	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	**#**	**%**
Satisfactory	132	99.3	103	81.8	124	93.9	193	100	142	95.3	128	97.0	185	94.4	185	93.4	127	85.8	264	99.6	303	93.8	263	96.3	148	95.5	**2,297**	**94.8**
Unsatisfactory	-	-	2	1.6	6	4.6	-	-	7	4.7	1	0.8	-	-	3	1.5	-	-	1	0.4	7	2.2	4	1.5	1	0.7	**32**	**1.3**
Other	-	-	2	1.6	2	1.5	-	-	-	-	-	-	1	0.5	-	-	1	0.7	-	-	2	0.6	5	1.8	-	-	**13**	**0.5**
Multiple**	-	-	1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	-	-	-	-	**2**	**0.1**
Missing**	1	0.8	18	14.3	-	-	-	-	-	-	3	2.3	10	5.1	10	5.1	20	13.5	-	-	10	3.1	1	0.4	6	3.9	**79**	**3.3**
Sub-total	**133**	**100**	**126**	**100**	**132**	**100**	**193**	**100**	**149**	**100**	**132**	**100**	**196**	**100**	**198**	**100**	**148**	**100**	**265**	**100**	**323**	**100**	**273**	**100**	**155**	**100**	**2,423**	**100**
DQC Listers	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	**#**	**%**
Satisfactory	37	94.9	34	100	37	94.9	55	93.2	31	83.8	52	88.1	54	93.1	62	100	46	97.9	81	81.8	103	96.3	50	92.6	23	100	**665**	**92.8**
Unsatisfactory	-	-	-	-	2	5.1	-	-	-	-	-	-	-	-	-	-	1	2.0	-	-	1	0.9	2	3.7	-	-	**6**	**0.8**
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1.9	-	-	-	-	**2**	**0.3**
Multiple**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
Missing**	2	5.1	-	-	-	-	4	6.8	6	16.2	7	11.9	4	6.9	-	-	-	-	18	18.2	1	0.9	2	3.7	-	-	**44**	**6.1**
Sub-total	**39**	**100**	**34**	**100**	**39**	**100**	**59**	**100**	**37**	**100**	**59**	**100**	**58**	**100**	**62**	**100**	**47**	**100**	**99**	**100**	**107**	**100**	**54**	**100**	**23**	**100**	**717**	**100**
Unknown**	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	**#**	**%**
Satisfactory	1	16.7	-	-	-	-	-	-	1	100	-	-	1	100	-	-	-	-	1	50.0	-	-	2	8.0	-	-	**6**	**13.0**
Unsatisfactory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	33.3	-	-	-	-	**1**	**2.2**
Other	1	16.7	1	100	1	100	2	100	-	-	-	-	-	-	-	-	1	50.0	1	50.0	-	-	23	92.0	1	100	**31**	**67.4**
Multiple**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
Missing**	4	66.7	-	-	-	-	-	-	-	-	1	100	-	-	-	-	1	50.0	-	-	2	66.7	-	-	-	-	**8**	**17.4**
Sub-total	**6**	**100**	**1**	**100**	**1**	**100**	**2**	**100**	**1**	**100**	**1**	**100**	**1**	**100**	**-**	**-**	**2**	**100**	**2**	**100**	**3**	**100**	**25**	**100**	**1**	**100**	**46**	**100**
All Roles	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	**#**	**%**
Satisfactory	170	95.5	137	85.1	161	93.6	248	97.6	174	93.1	180	93.8	240	94.1	247	95.0	173	87.8	346	94.5	406	93.8	315	89.5	171	95.5	**2,968**	**93.2**
Unsatisfactory	-	-	2	1.2	8	4.7	-	-	7	3.7	1	0.5	-	-	3	1.2	1	0.5	1	0.3	9	2.1	6	1.7	1	0.6	**39**	**1.2**
Other	1	0.6	3	1.9	3	1.7	2	0.8	-	-	-	-	1	0.4	-	-	2	1.0	1	0.3	4	0.9	28	8.0	1	0.6	**46**	**1.4**
Multiple**	-	-	1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	-	-	-	-	**2**	**0.1**
Missing**	7	3.9	18	11.2	-	-	4	1.6	6	3.2	11	5.7	14	5.5	10	3.9	21	10.7	18	4.9	13	3.0	3	0.9	6	3.4	**131**	**4.1**
Total	**178**	**100**	**161**	**100**	**172**	**100**	**254**	**100**	**187**	**100**	**192**	**100**	**255**	**100**	**260**	**100**	**197**	**100**	**366**	**100**	**433**	**100**	**352**	**100**	**179**	**100**	**3,186**	**100**

Data Source: Form D-1222(CCM-IL), Observation Checklist.

** After the 1st Obs, or after the 2nd Obs, if 1st Obs was not Satisfactory*

*** Procedural error*

Table 3A: Number of Observations Recorded on Observation Checklists by RCC

Section	1st Obs. Only		2nd Obs.		Total
Boston	Count	%	Count	%	Count
Listers	126	94.7	7	5.3	133
DQC Listers	38	97.4	1	2.6	39
Sub-total	**164**	**95.3**	**8**	**4.7**	**172**
New York	Count	%	Count	%	Count
Listers	124	98.4	2	1.6	126
DQC Listers	34	100.0	-	-	34
Sub-total	**158**	**98.8**	**2**	**1.3**	**160**
Philadelphia	Count	%	Count	%	Count
Listers	120	90.9	12	9.1	132
DQC Listers	38	97.4	1	2.6	39
Sub-total	**158**	**92.4**	**13**	**7.6**	**171**
Detroit	Count	%	Count	%	Count
Listers	191	99.0	2	1.0	193
DQC Listers	59	100.0	-	-	59
Sub-total	**250**	**99.2**	**2**	**0.8**	**252**
Chicago	Count	%	Count	%	Count
Listers	144	96.6	5	3.4	149
DQC Listers	37	100	-	-	37
Sub-total	**181**	**97.3**	**5**	**2.7**	**186**
Kansas City	Count	%	Count	%	Count
Listers	131	99.2	1	0.8	132
DQC Listers	59	100.0	-	-	59
Sub-total	**190**	**99.5**	**1**	**0.5**	**191**
Seattle	Count	%	Count	%	Count
Listers	185	94.4	11	5.6	196
DQC Listers	57	98.3	1	1.7	58
Sub-total	**242**	**95.3**	**12**	**4.7**	**254**
Charlotte	Count	%	Count	%	Count
Listers	187	94.4	11	5.6	198
DQC Listers	62	100.0	-	-	62
Sub-total	**249**	**95.8**	**11**	**4.2**	**260**
Atlanta	Count	%	Count	%	Count
Listers	119	80.4	29	19.6	148
DQC Listers	40	85.1	7	14.9	47
Sub-total	**159**	**81.5**	**36**	**18.5**	**195**
Dallas	Count	%	Count	%	Count
Listers	262	98.9	3	1.1	265
DQC Listers	98	99.0	1	1.0	99
Sub-total	**360**	**98.9**	**4**	**1.1**	**364**
Denver	Count	%	Count	%	Count
Listers	315	97.5	8	2.5	323
DQC Listers	102	95.3	5	4.7	107
Sub-total	**417**	**97.0**	**13**	**3.0**	**430**
Los Angeles	Count	%	Count	%	Count
Listers	262	96.0	11	4.0	273
DQC Listers	50	92.6	4	7.4	54
Sub-total	**312**	**95.4**	**15**	**4.6**	**327**
Puerto Rico	Count	%	Count	%	Count
Listers	149	96.1	6	3.9	155
DQC Listers	22	95.7	1	4.3	23
Sub-total	**171**	**96.1**	**7**	**3.9**	**178**
National					
Listers	2,315	95.5	108	4.5	2,423
DQC Listers	696	97.1	21	2.9	717
TOTAL	**3,011**	**95.9**	**129**	**4.1**	**3,140**

Data Source: Form D-1222(CCM-IL), Observation Checklist.

Table 4A: Distribution of Tasks Performed Incorrectly during Observation by RCC – Listers

Observation	Task 1		Task 2		Task 3		Task 4		Task 5		Task 6		Task 7		Task 8		Task 9		Task 10		Task 11		Task 12		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Boston																									
1st Obs.	1	7.7	1	7.7	-	-	1	7.7	2	15.4	2	15.4	1	7.7	-	-	2	15.4	1	7.7	-	-	2	15.4	**13**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	1	7.7	1	7.7	-	-	1	7.7	2	15.4	2	15.4	1	7.7	-	-	2	15.4	1	7.7	-	-	2	15.4	**13**
New York																									
1st Obs.	2	4.2	1	2.1	3	6.3	2	4.2	4	8.3	5	10.4	4	8.3	6	12.5	5	10.4	5	10.4	4	8.3	7	14.6	**48**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	2	4.2	1	2.1	3	6.3	2	4.2	4	8.3	5	10.4	4	8.3	6	12.5	5	10.4	5	10.4	4	8.3	7	14.6	**48**
Philadelphia																									
1st Obs.	3	6.4	3	6.4	4	8.5	1	2.1	1	2.1	3	6.4	4	8.5	2	4.3	11	23.4	7	14.9	5	10.6	3	6.4	**47**
2nd Obs.	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Total	4	8.3	3	6.3	4	8.3	1	2.1	1	2.1	3	6.3	4	8.3	2	4.2	11	22.9	7	14.6	5	10.4	3	6.3	**48**
Detroit																									
1st Obs.	2	9.1	1	4.5	-	-	-	-	3	13.6	4	18.2	1	4.5	4	18.2	1	4.5	1	4.5	2	9.1	3	13.6	**22**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	2	9.1	1	4.5	-	-	-	-	3	13.6	4	18.2	1	4.5	4	18.2	1	4.5	1	4.5	2	9.1	3	13.6	**22**
Chicago																									
1st Obs.	2	5.9	3	8.8	1	2.9	-	-	3	8.8	2	5.9	3	8.8	1	2.9	7	20.6	4	11.8	5	14.7	3	8.8	**34**
2nd Obs.	-	-	1	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	50.0	-	-	-	-	**2**
Total	2	5.6	4	11.1	1	2.8	-	-	3	8.3	2	5.6	3	8.3	1	2.8	7	19.4	5	13.9	5	13.9	3	8.3	**36**
Kansas City																									
1st Obs.	-	-	-	-	1	8.3	-	-	1	8.3	1	8.3	2	16.7	2	16.7	1	8.3	1	8.3	-	-	3	25.0	**12**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	**1**
Total	-	-	-	-	1	7.7	-	-	1	7.7	1	7.7	3	23.1	2	15.4	1	7.7	1	7.7	-	-	3	23.1	**13**
Seattle																									
1st Obs.	-	-	2	5.7	6	17.1	3	8.6	5	14.3	2	5.7	2	5.7	4	11.4	5	14.3	3	8.6	1	2.9	2	5.7	**35**
2nd Obs.	-	-	-	-	1	20.0	1	20.0	-	-	-	-	1	20.0	-	-	1	20.0	1	20.0	-	-	-	-	**5**
Total	-	-	2	5.0	7	17.5	4	10.0	5	12.5	2	5.0	3	7.5	4	10.0	6	15.0	4	10.0	1	2.5	2	5.0	**40**
Charlotte																									
1st Obs.	1	4.2	2	8.3	-	-	1	4.2	-	-	1	4.2	1	4.2	6	25.0	5	20.8	4	16.7	2	8.3	1	4.2	**24**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	1	4.2	2	8.3	-	-	1	4.2	-	-	1	4.2	1	4.2	6	25.0	5	20.8	4	16.7	2	8.3	1	4.2	**24**
Atlanta																									
1st Obs.	-	-	2	22.2	-	-	-	-	-	-	-	-	1	11.1	4	44.4	2	22.2	-	-	-	-	-	-	**9**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	50.0	1	50.0	-	-	**2**
Total	-	-	2	18.2	-	-	-	-	-	-	-	-	1	9.1	4	36.4	2	18.2	1	9.1	1	9.1	-	-	**11**
Dallas																									
1st Obs.	2	5.6	2	5.6	2	5.6	1	2.8	3	8.3	4	11.1	2	5.6	2	5.6	11	30.6	2	5.6	2	5.6	3	8.3	**36**
2nd Obs.	-	-	-	-	-	-	-	-	1	25.0	1	25.0	-	-	-	-	-	-	-	-	1	25.0	1	25.0	**4**
Total	2	5.0	2	5.0	2	5.0	1	2.5	4	10.0	5	12.5	2	5.0	2	5.0	11	27.5	2	5.0	3	7.5	4	10.0	**40**
Denver																									
1st Obs.	2	2.6	6	7.7	3	3.8	5	6.4	7	9.0	6	7.7	9	11.5	11	14.1	11	14.1	9	11.5	5	6.4	4	5.1	**78**
2nd Obs.	-	-	-	-	1	33.3	-	-	-	-	-	-	1	33.3	-	-	1	33.3	-	-	-	-	-	-	**3**
Total	2	2.5	6	7.4	4	4.9	5	6.2	7	8.6	6	7.4	10	12.3	11	13.6	12	14.8	9	11.1	5	6.2	4	4.9	**81**
Los Angeles																									
1st Obs.	2	3.9	3	5.9	1	2.0	1	2.0	5	9.8	4	7.8	4	7.8	5	9.8	5	9.8	7	13.7	7	13.7	7	13.7	**51**
2nd Obs.	-	-	1	10.0	-	-	-	-	-	-	-	-	-	-	1	10.0	2	20.0	2	20.0	2	20.0	2	20.0	**10**
Total	2	3.3	4	6.6	1	1.6	1	1.6	5	8.2	4	6.6	4	6.6	6	9.8	7	11.5	9	14.8	9	14.8	9	14.8	**61**
Puerto Rico																									
1st Obs.	-	-	1	7.7	1	7.7	1	7.7	-	-	-	-	1	7.7	3	23.1	1	7.7	1	7.7	-	-	4	30.8	**13**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	25.0	1	25.0	1	25.0	1	25.0	**4**
Total	-	-	1	5.9	1	5.9	1	5.9	-	-	-	-	1	5.9	3	17.6	2	11.8	2	11.8	1	5.9	5	29.4	**17**
TOTAL																									
1st Obs.	**17**	**4.0**	**27**	**6.4**	**22**	**5.2**	**16**	**3.8**	**34**	**8.1**	**34**	**8.1**	**35**	**8.3**	**50**	**11.8**	**67**	**15.9**	**45**	**10.7**	**33**	**7.8**	**42**	**10.0**	**422**
2nd Obs.	**1**	**3.1**	**2**	**6.3**	**2**	**6.3**	**1**	**3.1**	**1**	**3.1**	**1**	**3.1**	**3**	**9.4**	**1**	**3.1**	**5**	**15.6**	**6**	**18.8**	**5**	**15.6**	**4**	**12.5**	**32**
Total	**18**	**4.0**	**29**	**6.4**	**24**	**5.3**	**17**	**3.7**	**35**	**7.7**	**35**	**7.7**	**38**	**8.4**	**51**	**11.2**	**72**	**15.9**	**51**	**11.2**	**38**	**8.4**	**46**	**10.1**	**454**

Data Source: Form D-1222(CCM-IL), Observation Checklist.

Table 5A: Distribution of Tasks Performed Incorrectly during Observation by RCC – DQC Listers

Observation	Task 1		Task 2		Task 3		Task 4		Task 5		Task 6		Task 7		Task 8		Task 9		Task 10		Task 11		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Boston																							
1st Obs.	-	-	-	-	1	11.1	1	11.1	-	-	1	11.1	-	-	-	-	2	22.2	2	22.2	2	22.2	**9**
2nd Obs.	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Total	-	-	-	-	2	20.0	1	10.0	-	-	1	10.0	-	-	-	-	2	20.0	2	20.0	2	20.0	**10**
New York																							
1st Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Philadelphia																							
1st Obs.	-	-	-	-	1	50.0	-	-	1	50.0	-	-	-	-	-	-	-	-	-	-	-	-	**2**
2nd Obs.	-	-	-	-	-	-	-	-	1	20.0	1	20.0	1	20.0	1	20.0	1	20.0	-	-	-	-	**5**
Total	-	-	-	-	1	14.3	-	-	2	28.6	1	14.3	1	14.3	1	14.3	1	14.3	-	-	-	-	**7**
Detroit																							
1st Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Chicago																							
1st Obs.	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	**1**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Kansas City																							
1st Obs.	-	-	1	5.3	6	31.6	2	10.5	1	5.3	2	10.5	1	5.3	1	5.3	3	15.8	2	10.5	-	-	**19**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	1	5.3	6	31.6	2	10.5	1	5.3	2	10.5	1	5.3	1	5.3	3	15.8	2	10.5	-	-	**19**
Seattle																							
1st Obs.	-	-	1	7.1	7	50.0	-	-	2	14.3	2	14.3	2	14.3	-	-	-	-	-	-	-	-	**14**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	1	7.1	7	50.0	-	-	2	14.3	2	14.3	2	14.3	-	-	-	-	-	-	-	-	**14**
Charlotte																							
1st Obs.	-	-	-	-	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2**
Atlanta																							
1st Obs.	1	9.1	-	-	3	27.3	2	18.2	1	9.1	1	9.1	1	9.1	1	9.1	1	9.1	-	-	-	-	11
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1	9.1	-	-	3	27.3	2	18.2	1	9.1	1	9.1	1	9.1	1	9.1	1	9.1	-	-	-	-	11
Dallas																							
1st Obs.	-	-	-	-	2	66.7	-	-	1	33.3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	2	66.7	-	-	1	33.3	-	-	-	-	-	-	-	-	-	-	-	-	**3**
Denver																							
1st Obs.	1	4.5	-	-	3	13.6	1	4.5	2	9.1	6	27.3	4	18.2	1	4.5	1	4.5	2	9.1	1	4.5	**22**
2nd Obs.	-	-	-	-	-	-	-	-	1	33.3	1	33.3	1	33.3	-	-	-	-	-	-	-	-	**3**
Total	1	4.0	-	-	3	12.0	1	4.0	3	12.0	7	28.0	5	20.0	1	4.0	1	4.0	2	8.0	1	4.0	**25**
Los Angeles																							
1st Obs.	1	25.0	-	-	-	-	-	-	-	-	-	-	1	25.0	-	-	1	25.0	1	25.0	-	-	**4**
2nd Obs.	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Total	1	20.0	-	-	1	20.0	-	-	-	-	-	-	1	20.0	-	-	1	20.0	1	20.0	-	-	**5**
Puerto Rico																							
1st Obs.	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	**1**
2nd Obs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Total	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	**1**
TOTAL																							
1st Obs.	**3**	**3.4**	**2**	**2.3**	**25**	**28.4**	**6**	**6.8**	**10**	**11.4**	**12**	**13.6**	**9**	**10.2**	**3**	**3.4**	**8**	**9.1**	**7**	**8.0**	**3**	**3.4**	**88**
2nd Obs.	**-**	**-**	**-**	**-**	**2**	**20.0**	**-**	**-**	**2**	**20.0**	**2**	**20.0**	**2**	**20.0**	**1**	**10.0**	**1**	**10.0**	**-**	**-**	**-**	**-**	**10**
Total	**3**	**3.1**	**2**	**2.0**	**27**	**27.6**	**6**	**6.1**	**12**	**12.2**	**14**	**14.3**	**11**	**11.2**	**4**	**4.1**	**9**	**9.2**	**7**	**7.1**	**3**	**3.1**	**98**

Data Source: Form D-1222(CCM-IL), Observation Checklist.

Table 6A: Listing Office Edit Results by RCC

RCC	Pass		Fail		Multiple *		Blank*		Total
	#	%	#	%	#	%	#	%	#
Boston	649	81.2	133	16.7	1	0.1	16	2.0	799
New York	417	96.1	10	2.3	-	-	7	1.6	434
Philadelphia	721	91.4	53	6.7	1	0.1	14	1.8	789
Detroit	733	93.4	45	5.7	1	0.1	6	0.8	785
Chicago	611	74.9	195	23.9	1	0.1	9	1.1	816
Kansas City	997	96.6	31	3.0	-	-	4	0.4	1,032
Seattle	1,002	95.2	43	4.1	-	-	8	0.8	1,053
Charlotte	1,069	98.2	2	0.2	1	0.1	17	1.6	1,089
Atlanta	1,069	89.3	127	10.6	-	-	1	0.1	1,197
Dallas	979	78.6	259	20.8	1	0.1	6	0.5	1,245
Denver	1,636	96.8	19	1.1	-	-	35	2.1	1,690
Los Angeles	858	94.7	45	5.0	-	-	3	0.3	906
Puerto Rico	476	90.0	53	10.0	-	-	-	-	529
TOTAL	**11,217**	**90.7**	**1,015**	**8.2**	**6**	**0.1**	**126**	**1.0**	**12,364**

Data Source: Section 3, item 1. Listing Office Edit from Form D-1302, CCM ILB.

***** *Procedural error*

Table 7A: Dependent Quality Check Office Edit Results by RCC

RCC	Pass		Fail		Multiple *		Blank*		Total
	#	%	#	%	#	%	#	%	#
Boston	780	97.6	4	0.5	-	-	15	1.9	799
New York	429	98.9	1	0.2	-	-	4	0.9	434
Philadelphia	740	93.8	6	0.8	-	-	43	5.5	789
Detroit	707	90.1	1	0.1	-	-	77	9.8	785
Chicago	797	97.7	3	0.4	2	0.3	14	1.7	816
Kansas City	997	96.6	7	0.7	-	-	28	2.7	1,032
Seattle	999	94.9	4	0.4	-	-	50	4.8	1,053
Charlotte	1,079	99.1	-	-	-	-	10	0.9	1,089
Atlanta	1,145	95.7	9	0.8	-	-	43	3.6	1,197
Dallas	1,199	96.3	6	0.5	10	0.8	30	2.4	1,245
Denver	1,675	99.1	2	0.1	-	-	13	0.8	1,690
Los Angeles	885	97.7	7	0.8	5	0.6	9	1.0	906
Puerto Rico	518	97.9	-	-	-	-	11	2.1	529
TOTAL	**11,950**	**96.7**	**50**	**0.4**	**17**	**0.1**	**347**	**2.8**	**12,364**

Data Source: Section 3, item 6. DQC Office Edit from Form D-1302, CCM ILB.

***** *Procedural error*

Table 8A: Type of Listing by RCC

RCC	Initial		Redo		Total
	#	%	#	%	#
Boston	798	99.9	1	0.1	799
New York	434	100	-	-	434
Philadelphia	789	100	-	-	789
Detroit	785	100	-	-	785
Chicago	814	99.8	2	0.3	816
Kansas City	1,030	99.8	2	0.2	1,032
Seattle	1,053	100	-	-	1,053
Charlotte	1,087	99.8	2	0.2	1,089
Atlanta	1,188	99.3	9	0.8	1,197
Dallas	1.241	99.7	4	0.3	1,245
Denver	1,668	99.9	2	0.1	1,690
Los Angeles	901	99.5	5	0.6	906
Puerto Rico	525	99.2	4	0.8	529
TOTAL	**12,333**	**99.8**	**31**	**0.3**	**12,364**

Data Source: Section 1 from Form D-1302, CCM ILB.

Table 9A: Dependent Quality Check Results by RCC

RCC	Pass		Fail		Fail/Redo*		Multiple*		Blank*		Total
	#	%	#	%	#	%	#	%	#	%	#
Boston	616	77.1	176	22.0	-	-	2	0.3	5	0.6	799
New York	333	76.7	99	22.8	-	-	1	0.2	1	0.2	434
Philadelphia	631	80.0	158	20.0	-	-	-	-	-	-	789
Detroit	688	87.6	85	10.8	1	0.1	-	-	11	1.4	785
Chicago	613	75.1	199	24.4	2	0.3	-	-	2	0.3	816
Kansas City	820	79.5	205	19.9	-	-	2	0.2	5	0.5	1,032
Seattle	886	84.1	163	15.5	-	-	1	0.1	3	0.3	1,053
Charlotte	930	85.4	158	14.5	-	-	-	-	1	0.1	1,089
Atlanta	863	72.1	331	27.7	-	-	-	-	3	0.3	1,197
Dallas	897	72.1	341	27.4	-	-	2	0.2	5	0.4	1,245
Denver	1,499	88.7	187	11.1	2	0.1	1	0.1	1	0.1	1,690
Los Angeles	729	80.5	171	18.9	-	-	1	0.1	5	0.6	906
Puerto Rico	402	76.0	123	23.3	1	0.2	-	-	3	0.6	529
TOTAL	**9,907**	**80.1**	**2,396**	**19.4**	**6**	**0.1**	**10**	**0.1**	**45**	**0.4**	**12,364**

Data Source: Section 3, item 4. DQC Result from Form D-1302, CCM ILB.

***** *Procedural error*

Table 10A: Dependent Quality Check Fail Rate Discrepancies by RCC

RCC	Total	Block Clusters That Had a Result of Fail or Fail/Redo		Block Clusters That Should Have Failed*	
	Count	Count	%	Count	%
Boston	799	176	22.0	183	22.9
New York	434	99	22.8	101	23.3
Philadelphia	789	158	20.0	163	20.7
Detroit	785	86	11.0	88	11.2
Chicago	816	201	24.6	196	24.0
Kansas City	1,032	205	19.9	213	20.6
Seattle	1,053	163	15.5	169	16.0
Charlotte	1,089	158	14.5	162	14.9
Atlanta	1,197	331	27.7	331	27.7
Dallas	1,245	341	27.4	341	27.4
Denver	1,690	189	11.2	201	11.9
Los Angeles	906	171	18.9	175	19.3
Puerto Rico	529	124	23.4	126	23.8
TOTAL	**12,364**	**2,402**	**19.4**	**2,449**	**19.8**

Data Source: Section 3, item 3. DQC Lister and item 4. DQC Result from Form D-1302, CCM ILB.

* Block clusters with one or more critical errors recorded in Section 3 of ILB

Table 11A: Block Clusters with Correct Sample Size Recorded by RCC

RCC	Total Block Clusters	Block Clusters with Correct Sample Size	
	Count	Count	%
Boston	799	770	96.4
New York	434	421	97.0
Philadelphia	789	764	96.8
Detroit	785	757	96.4
Chicago	816	801	98.2
Kansas City	1,032	994	96.3
Seattle	1,053	1,030	97.8
Charlotte	1,089	1,071	98.3
Atlanta	1,197	1,159	96.8
Dallas	1,245	1,205	96.8
Denver	1,690	1,631	96.5
Los Angeles	906	869	95.9
Puerto Rico	529	515	97.4
TOTAL	**12,364**	**11,987**	**97.0**

Data Source: Section 3, item 3. DQC Lister from Form D-1302, CCM ILB.

Table 12A: Critical Errors Detected and Corrections Made during the Dependent Quality Check by RCC

*Column in Section 3 of the ILB

RCC	3		4		5		6		7		8		9		10		11		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Boston	88	15.1	56	9.6	325	55.7	45	7.7	20	3.4	43	7.4	3	0.5	1	0.2	3	0.5	584
New York	22	8.1	23	8.5	85	31.5	47	17.4	49	18.1	39	14.4	5	1.9	-	-	-	-	270
Philadelphia	92	19.0	77	15.9	232	47.9	24	5.0	24	5.0	26	5.4	1	0.2	-	-	8	1.7	484
Detroit	44	23.5	21	11.2	93	49.7	5	2.7	6	3.2	14	7.5	-	-	-	-	4	2.1	187
Chicago	80	13.2	86	14.2	289	47.8	49	8.1	31	5.1	50	8.3	12	2.0	-	-	7	1.2	604
Kansas City	132	26.9	91	18.5	198	40.3	14	2.9	19	3.9	27	5.5	3	0.6	3	0.6	4	0.8	491
Seattle	99	22.5	44	10.0	231	52.5	19	4.3	15	3.4	24	5.5	5	1.1	-	-	3	0.7	440
Charlotte	84	17.0	86	17.4	268	54.4	6	1.2	25	5.1	9	1.8	3	0.6	-	-	12	2.4	493
Atlanta	103	9.6	146	13.7	643	60.1	44	4.1	50	4.7	29	2.7	12	1.1	8	0.7	34	3.2	1069
Dallas	145	12.6	137	11.9	779	67.5	26	2.3	7	0.6	53	4.6	2	0.2	3	0.3	3	0.3	1155
Denver	130	23.3	84	15.0	292	52.2	7	1.3	6	1.1	21	3.8	5	0.9	2	0.4	12	2.1	559
Los Angeles	83	14.4	77	13.4	309	53.7	40	7.0	26	4.5	24	4.2	1	0.2	1	0.2	14	2.4	575
Puerto Rico	50	8.1	110	17.9	404	65.7	30	4.9	11	1.8	5	0.8	-	-	1	0.2	4	0.7	615
TOTAL	**1,152**	**15.3**	**1,038**	**13.8**	**4,148**	**55.1**	**356**	**4.7**	**289**	**3.8**	**364**	**4.8**	**52**	**0.7**	**19**	**0.2**	**108**	**1.4**	**7,526**

*Column #	Description of Type of Correction Made by the DQC Lister
3	Section 4 – Added a BSA
4	Section 4 – Deleted a BSA
5	Section 4 – Corrected a BSA's • Map Spot No. • Type of unit • Address
6	Section 5 – Added one or more units
7	Section 5 – Deleted one or more units
8	Section 5 – Corrected one or more of the following: • Unit designation • Unit status
9	Section 6 – Added one or more units/sites
10	Section 6 – Deleted one or more units/sites
11	Section 6 – Corrected one or more of the following: • Map Spot No. • Unit status • Address

Data Source: Section 3, item 3. DQC Lister from Form D-1302, CCM ILB.

Table 13A: Dependent Quality Check and Total Verification Workloads by RCC

RCC	Estimated # of Section 4 Listings	# of Section 4 Listings in DQC sample	DQC Sampling Rate	Clusters With Result of Fail or Fail/Redo			Clusters That Should Have Failed*		
				Estimated # of Section 4 Listings Rectified	Estimated # of Section 4 Listings Checked**	% of Estimated Section 4 Listings Checked	Estimated # of Section 4 Listings Rectified	Estimated # of Section 4 Listings Checked**	% of Estimated Section 4 Listings Checked
Boston	35,917	7,931	22.1	5,060	12,991	36.2	5,225	13,156	36.6
New York	16,945	4,557	26.9	2,599	7,156	42.2	2,706	7,263	42.9
Philadelphia	40,483	7,809	19.3	4,549	12,358	30.5	4,888	12,697	31.4
Detroit	38,166	7,729	20.3	2,709	10,438	27.3	2,758	10,487	27.5
Chicago	32,135	7,920	24.6	5,104	13,024	40.5	4,894	12,814	39.9
Kansas City	32,966	8,405	25.5	3,702	12,107	36.7	3,918	12,323	37.4
Seattle	48,271	8,983	18.6	5,893	14,876	30.8	5,999	14,982	31.0
Charlotte	63,216	10,342	16.4	4,459	14,801	23.4	4,479	14,821	23.4
Atlanta	72,758	10,984	15.1	12,246	23,230	31.9	12,502	23,486	32.3
Dallas	57,591	10,502	18.2	10,685	21,187	36.8	11,470	21,972	38.2
Denver	49,743	12,447	25.0	3,314	15,761	31.7	4,139	16,586	33.3
Los Angeles	49,060	8,874	18.1	5,920	14,794	30.2	5,999	14,873	30.3
Puerto Rico	44,222	5,290	12.0	8,272	13,562	30.7	8,365	13,655	30.9
TOTAL	**581,473**	**111,773**	**19.2**	**74,512**	**186,285**	**32.0**	**77,342**	**189,115**	**32.5**

Data Source: Section 1, item 11; Section 3, item 3. DQC Lister and item 4. DQC Result from Form D-1302, CCM ILB.

* Block clusters with one or more critical errors recorded in Section 3 of the ILB

** DQC sample + rectification

Table 14A: DQC Results Versus Rectification Data by RCC

DQC	Total Clusters	Clusters with Rectification Data	
		#	%
Boston			
No Critical Errors Recorded	616	7	1.1
Critical Errors Recorded	183	172	94.0
Sub-Total	799	179	22.4
New York			
No Critical Errors Recorded	333	-	-
Critical Errors Recorded	101	97	96.0
Sub-Total	434	97	22.4
Philadelphia			
No Critical Errors Recorded	626	3	0.5
Critical Errors Recorded	163	158	96.9
Sub-Total	789	161	20.4
Detroit			
No Critical Errors Recorded	697	10	1.4
Critical Errors Recorded	88	78	88.6
Sub-Total	785	88	11.2
Chicago			
No Critical Errors Recorded	620	21	3.4
Critical Errors Recorded	196	185	94.4
Sub-Total	816	206	25.2
Kansas City			
No Critical Errors Recorded	819	1	0.1
Critical Errors Recorded	213	206	96.7
Sub-Total	1,032	207	20.1
Seattle			
No Critical Errors Recorded	884	4	0.5
Critical Errors Recorded	169	162	95.9
Sub-Total	1,053	166	15.8
Charlotte			
No Critical Errors Recorded	927	31	3.3
Critical Errors Recorded	162	151	93.2
Sub-Total	1,089	182	16.7
Atlanta			
No Critical Errors Recorded	866	20	2.3
Critical Errors Recorded	331	323	97.6
Sub-Total	1,197	343	28.7
Dallas			
No Critical Errors Recorded	904	23	2.5
Critical Errors Recorded	341	326	95.6
Sub-Total	1,245	349	28.0
Denver			
No Critical Errors Recorded	1,489	13	0.9
Critical Errors Recorded	201	186	92.5
Sub-Total	1,690	199	11.8
Los Angeles			
No Critical Errors Recorded	731	6	0.8
Critical Errors Recorded	175	162	92.6
Sub-Total	906	168	18.5
Puerto Rico			
No Critical Errors Recorded	403	2	0.5
Critical Errors Recorded	126	126	100
Sub-Total	529	128	24.2
National			
No Critical Errors Recorded	9,915	141	1.4
Critical Errors Recorded	2,449	2,332	95.2
TOTAL	**12,364**	**2,473**	**20.0**

Data Source: Section 3, item 5. Rectification from Form D-1302, CCM ILB.

Table 15A: Rectification Corrections by RCC

RCC	Estimated HUs	Addresses Added		Addresses Deleted		Addresses Corrected	
		#	%	#	%	#	%
Boston	49,710	313	0.6	123	0.2	1,164	2.3
New York	56,580	231	0.4	188	0.3	477	0.8
Philadelphia	62,260	586	0.9	394	0.6	1,489	2.4
Detroit	49,740	118	0.2	71	0.1	266	0.5
Chicago	49,083	544	1.1	357	0.7	972	2.0
Kansas City	43,833	280	0.6	228	0.5	521	1.2
Seattle	73,036	380	0.5	120	0.2	689	0.9
Charlotte	81,910	370	0.5	528	0.6	988	1.2
Atlanta	115,299	1,134	1.0	1,304	1.1	3,024	2.6
Dallas	87,864	802	0.9	314	0.4	3,751	4.3
Denver	74,322	436	0.6	396	0.5	641	0.9
Los Angeles	87,277	530	0.6	405	0.5	1,012	1.2
Puerto Rico	58,663	370	0.6	757	1.3	2,768	4.7
TOTAL	**889,577**	**6,094**	**0.7**	**5,185**	**0.6**	**17,762**	**2.0**

Data Source: Section 1, item 10 and Section 3, item 5. Rectification from Form D-1302, CCM ILB.

FORM **D-1222(CCM-IL)**
(11-18-2008)

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

OBSERVATION CHECKLIST
CENSUS COVERAGE MEASUREMENT
INDEPENDENT LISTING
2010 Census

IDENTIFICATION ITEMS

1. Lister/DQC Lister
a. Name
b. FR Code

2. Type of observation – *Mark (X) one*
1 ☐ Production 2 ☐ DQC

	3. Observer	4. Date – *Month/Day*	5. No. of listings observed	6. Crew Leader District No.
1st Observation	a. Name b. FR Code	/		
2nd Observation	a. Name b. FR Code	/		7. RCC No.

SAFETY & SECURITY REMINDERS

- As required by law, use a seatbelt while driving.
- Protect all Title 13 data or any medium that may contain personally identifiable information.
- Any lost or stolen medium containing Title 13 data or personally identifiable information must be reported as soon as possible according to the instructions in your manuals.

GENERAL INSTRUCTIONS

- Use this checklist to evaluate and document overall performance of the lister/DQC lister as you observe the crew member in the field.
- As you are observing, keep in mind the tasks listed.
- For every task listed – *Mark **X** in the appropriate column:*
  Y – Yes, task observed and performed correctly.
  N – No, task observed but not performed correctly – *Discuss proper procedure before observing next address.*
  NA – Not Applicable, task not observed – *Discuss proper procedure at the end of observation.*
- Use **Section A** to record performance for lister.
- Use **Section B** to record performance for DQC lister (on reverse side).
- Use **Section C** to record observation result for lister/DQC lister.

Section A – LISTER OBSERVATION

Tasks	1st Observation			2nd Observation		
	Y	N	NA	Y	N	NA
I. Canvassing						
1. Traveled through the assigned block cluster and looked for housing units						
II. Listing						
2. Listed correct block(s) in the block cluster						
3. Checked for additional housing units at every basic street address (BSA)						
4. Attempted to conduct a brief interview at every BSA						
5. Contacted or attempted to contact a resident manager, superintendent, or other knowledgeable person at a multi-unit structure about the housing units in the multiunit						
6. Contacted or attempted to contact an owner, manager, or other knowledgeable person at a mobile home or trailer park about the mobile home(s)/trailer(s) and/or empty lot(s)/site(s) in the park						
7. Showed Census identification and used appropriate introduction at each BSA						
8. Provided a copy of the Confidentiality Notice to each respondent						
9. Recorded complete information about each housing unit in appropriate section of the ILB						
III. Mapspotting on CCM Block Maps						
10. Marked the location of each BSA containing HUs listed in Section 4 and each mobile home/trailer or empty lot/site listed in Section 6 with a map spot and map-spot number						
11. Made corrections and/or updates to street features on the map						
12. Entered the correct number of apartments listed in Section 5 in parentheses next to the map-spot number for a multi-unit structure						

Section C – OBSERVATION RESULT

- Rate **"Satisfactory"** if the lister/DQC lister demonstrated a good overall understanding of the tasks.
- If you believe the lister/DQC lister did **NOT** demonstrate a good overall understanding of the tasks after the 1st observation, contact your immediate supervisor to discuss action to be taken (retraining, 2nd observation, mark "Unsatisfactory," etc).
  - **Do not mark "Unsatisfactory"** after 1st observation unless instructed by your supervisor.
  - If a 2nd observation is conducted, *mark the result of the 2nd observation only.*
- **Other** – can be used if the lister/DQC lister resigned before you could observe him or her in the field.
- **Notes** – are required detailing procedural problems observed and actions to be taken.

1 ☐ **Satisfactory –** By the end of observation, lister/DQC lister understands and follows procedures.
2 ☐ **Unsatisfactory –** By the end of observation, lister/DQC lister does **NOT** understand or follow procedures. *(Notes required to explain.)*
3 ☐ **Other –** For example, employee resigned before observation could take place. *(Notes required to explain.)*

Section B – DQC LISTER OBSERVATION

Tasks	1st Observation			2nd Observation		
	Y	N	NA	Y	N	NA
DQC Verification						
1. Started DQC in correct block at correct BSA for line number in ILB designated as the random start						
2. Checked correct block(s)						
3. Listing on line indicated by random start number and on next 11 lines in the ILB are outside the block cluster – Marked the block cluster as "Fail/Redo" in Section 3 of the ILB and returned the ILB and maps to the QC Crew Leader or QC Crew Leader Assistant						
4. Performed the DQC by verifying the proper listing and mapspotting of the BSAs in the sample string						
5. Recorded the results of the DQC in Section 3 of the ILB						
6. If block cluster failed DQC – Rectified the block cluster by verifying the proper listing and mapspotting of all remaining housing units on the ground in the block cluster						
7. Recorded the results of the rectification in Section 3 of the ILB						
8. Corrected each error detected by correcting missing/incorrect address items, adding missing housing units, or deleting erroneously listed housing units or nonresidential units in the ILB						
9. Corrected erroneous or missing map spots and/or map-spot numbers on the CCM Block Map(s) for the block cluster						
10. Fixed critical errors identified by the office edit						
11. Verified street feature updates to the map(s)						

NOTES

Sections 1-6 of Form D-1302, Census Coverage Measurement Independent Listing Book

FORM **D-1302** (12-9-2008)

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

CENSUS COVERAGE MEASUREMENT (CCM) INDEPENDENT LISTING BOOK (ILB) 2010 Census

CENSUS CONFIDENTIAL: RESTRICTED DATA FOR OFFICIAL USE ONLY. Information contained in this report is for use by the Census Bureau and is confidential by law (Title 13, U.S.C.). It may be seen only by persons sworn to protect the confidentiality of the data and may be used only for statistical purposes. Access restricted to authorized CCM staff.

6. Sample block(s) to be listed (after listing enter number of HUs in each block)

APPLY LABEL HERE

Blocks	HUs	Blocks	HUs	Blocks	HUs	Blocks	HUs	7. Description and notes

Section 1 – IDENTIFICATION

APPLY LABEL HERE

1. Cluster No.

2. LCO name — Code

3. County — Code

4. State — Code

5. TEA

BOOK ____ **OF** ____ **BOOKS**

8. Cluster situations – *Also make entry on "Notes Page."*
1 ☐ Safety
2 ☐ Restricted access
3 ☐ Language
4 ☐ No mailboxes
5 ☐ Road conditions
6 ☐ Other

9. Other maps
1 ☐ Sketch map
2 ☐ Auxiliary map

10. Total number of HUs listed in the cluster.

11. Number of lines used in Section 4 of all ILBs for cluster.

12. DQC random start number

Section 2 – ASSIGNMENT INFORMATION

Position (a)	CLD (b)	Name (c)	FR Code (d)	Telephone Number (e)	Dates Assigned (f) Month	Dates Assigned (f) Day	Dates Completed (g) Month	Dates Completed (g) Day
1. Crew Leader				– –				
2. Lister				– –				
3. Lister				– –				
4. QC Crew Leader				– –				
5. DQC Lister				– –				
6. DQC Lister				– –				

NOTICE TO FINDER

If found, please either call **1–301–763–3301** to arrange for pickup

OR

mail to:
Field Division
US Census Bureau
4600 Silver Hill Road
Washington DC 20233-5700
Attn: Coverage Measurement Branch

CENSUS USE ONLY – *To be completed by the National Processing Center*

Cover Page(s) ____ Section 4 Page(s) ____ Section 5 Page(s) ____ Section 6 Page(s) ____

Section 3 – QUALITY ASSURANCE

Hello, I am *(Your name)* **from the U.S. Census Bureau. Here is my identification. Recently, Census employees checked addresses in this area as part of the 2010 Census. I am here to check the quality of their work. My questions should take about 2 minutes. What is this address?**

1. LISTING OFFICE EDIT

Result	Date *(mm/dd/yy)*	Office editor name	FR Code
1 ☐ Pass 2 ☐ Fail – *Send for repair*	☐☐ – ☐☐ – ☐☐		☐☐☐

6. DQC OFFICE EDIT

Result	Date *(mm/dd/yy)*	Office editor name	FR Code
1 ☐ Pass 2 ☐ Fail – *Send for repair*	☐☐ – ☐☐ – ☐☐		☐☐☐

2. DQC OFFICE STAFF

Start DQC in book ☐☐, on line number ☐☐☐, and continue with next 11 BSAs with HUs on ground.

3. DQC LISTER

		Listing Incorrect: Types of Corrections										
		Section 4			Section 5			Section 6				
ILB Line No. (1)	Listing correct (2)	Added a BSA (3)	Deleted a BSA (4)	Corrected a BSA's • Map Spot No. • Type of unit • Unit status • Address *(exclude spelling and street-type errors)* Each BSA must have: • Structure Identifier, if required AND • A House No. and Road/Street name OR • A Rural Rte. No. and Box No. OR • A Physical location description or E-911 address (5)	Added one or more units (6)	Deleted one or more units (7)	Corrected one or more of the following: • Unit designation • Unit status (8)	Added one or more units/sites (9)	Deleted one or more units/sites (10)	Corrected one or more of the following: • Map Spot No. • Unit status • Address *(exclude spelling and street-type errors)* Each Housing unit/site must have: • A House No. and Road/Street name OR • A Lot No. and Road/Street name OR • A Rural Rte. No. and Box No. OR • A Physical description (11)
Total												

4. DQC Result – *Mark (X) only one.*

1 ☐ Pass – No errors in columns (3)–(11)

2 ☐ Fail – One or more errors in columns (3)–(11)
Rectify ILB(s) for entire cluster

3 ☐ Fail/Redo – Lister listed wrong block(s)
STOP DQC – Turn in ILB(s) for Redo

5. RECTIFICATION

1. Block number											
2. Number of addresses added											
3. Number of addresses deleted											
4. Number of addresses corrected											

FORM D-1302 (12-9-2008)

Section 4 – LISTING PAGE

Hello, I'm *(Your name)* **from the U.S. Census Bureau. Here is my identification. We are listing addresses as part of the 2010 Census, and I have a few questions to ask you. It should take us about 2 minutes. What is this address?**

(1) Line No. 1 | **(2)** Block No. | **(3)** Map Spot No. – *Do not fill for Mobile Home Park.* Number / Letter

(4) House No. | **(5a)** Road/Street name

(5b) Structure Identifier

(6a) Rural Rte. No. | **(6b)** Box No. | **(7)** PO Box No.

(8) City | **(9)** ZIP Code

Complete items 10 and 11 for areas with non-city style addresses.

(10) Householder name — First / MI / Last

(11) Physical location description or E-911 address

(12a) Is this a single-family house, multiunit, mobile home, or trailer?

1 ☐ Single-family house (including townhouse, rowhouse, etc. if each has its own basic street address (BSA)) – *Go to 12b*
2 ☐ Multiunit – two or more housing units in a structure sharing a single BSA (such as an apartment house or building, or a house with attached basement or attic apartment) – *SKIP to 14a*
3 ☐ Mobile home or trailer, NOT in a park – *Go to 12b*
4 ☐ Mobile home or trailer, IN a park – *SKIP to Section 6, Mobile Home Park Page*
5 ☐ Other (occupied camper, tent, van, boat, etc.) – *SKIP to 15*

Reminder: *If two or more buildings or structures (like an HU and a trailer) share the same BSA, list each building/structure on a separate line and enter a description in the "Structure Identifier" field to distinguish between buildings/structures.*

(12b) Unit status

1 ☐ Occupied or vacant and intended for occupancy – *Go to 13*
2 ☐ Under construction (foundation and building materials present) . . .
3 ☐ Future construction – *Mark (X) all that apply.*
a ☐ A sign indicating future construction is planned, ...
b ☐ A building permit, ...
c ☐ Stakes in the ground, ...
d ☐ A zoning change sign from commercial use to residential use
e ☐ Other – *Specify*
4 ☐ Unfit for habitation . . . . . .
5 ☐ Boarded up . . . . . .
6 ☐ Storage of household goods – *SKIP to 16*
8 ☐ Other – *Skip to 15*

SKIP to 15

(13) At *(address)***, are there any basement or garage apartments, trailers, or other residences, even if no one is living there now?**

1 ☐ Yes – **How many?** ____

Is/Are the other residence(s) attached to the main residence (e.g., basement apartment) **and/or detached** (e.g., mobile home, carriage house)**?**

a ☐ Attached – *Change item 12a to multiunit, then go to 14a.*
b ☐ Detached – *SKIP to 16 then go to the next line number and record other residence.*
2 ☐ No – *SKIP to 16*

MULTIUNIT ADDRESS

(14a) *Canvass the multiunit and enter the number of units on each floor.*

Basement | 1st floor | 2nd floor | 3rd floor | 4th floor | 5th floor | 6th floor
7th floor | 8th floor | 9th floor | 10th floor | 11th floor | 12th floor | Attic
☐ Other –

Example: "5 APTS 14th FLR"

(14b) *(Ask if an apartment or a condominium)* **How many apartments, occupied or vacant, are there at** *(address)***?**

____ Total number of Housing Units (occupied or vacant)

(15) Remarks – *Do not use this space for location description.*

(16) Information obtained from: 1 ☐ HH member* 2 ☐ Proxy* 3 ☐ Manager* 4 ☐ Observation

*Respondent name | Telephone No.

OFFICE EDIT IL | QC | CL | QC CL | DQC

If multiunit (answered 14b), then go to Section 5, Multiunit Address Page.

Hello, I'm *(Your name)* **from the U.S. Census Bureau. Here is my identification. We are listing addresses as part of the 2010 Census, and I have a few questions to ask you. It should take us about 2 minutes. What is this address?**

(1) Line No. 2 | **(2)** Block No. | **(3)** Map Spot No. – *Do not fill for Mobile Home Park.* Number / Letter

(4) House No. | **(5a)** Road/Street name

(5b) Structure Identifier

(6a) Rural Rte. No. | **(6b)** Box No. | **(7)** PO Box No.

(8) City | **(9)** ZIP Code

Complete items 10 and 11 for areas with non-city style addresses.

(10) Householder name — First / MI / Last

(11) Physical location description or E-911 address

(12a) Is this a single-family house, multiunit, mobile home, or trailer?

1 ☐ Single-family house (including townhouse, rowhouse, etc. if each has its own basic street address (BSA)) – *Go to 12b*
2 ☐ Multiunit – two or more housing units in a structure sharing a single BSA (such as an apartment house or building, or a house with attached basement or attic apartment) – *SKIP to 14a*
3 ☐ Mobile home or trailer, NOT in a park – *Go to 12b*
4 ☐ Mobile home or trailer, IN a park – *SKIP to Section 6, Mobile Home Park Page*
5 ☐ Other (occupied camper, tent, van, boat, etc.) – *SKIP to 15*

Reminder: *If two or more buildings or structures (like an HU and a trailer) share the same BSA, list each building/structure on a separate line and enter a description in the "Structure Identifier" field to distinguish between buildings/structures.*

(12b) Unit status

1 ☐ Occupied or vacant and intended for occupancy – *Go to 13*
2 ☐ Under construction (foundation and building materials present) . . .
3 ☐ Future construction – *Mark (X) all that apply.*
a ☐ A sign indicating future construction is planned, ...
b ☐ A building permit, ...
c ☐ Stakes in the ground, ...
d ☐ A zoning change sign from commercial use to residential use
e ☐ Other – *Specify*
4 ☐ Unfit for habitation . . . . . .
5 ☐ Boarded up . . . . . .
6 ☐ Storage of household goods – *SKIP to 16*
8 ☐ Other – *Skip to 15*

SKIP to 15

(13) At *(address)***, are there any basement or garage apartments, trailers, or other residences, even if no one is living there now?**

1 ☐ Yes – **How many?** ____

Is/Are the other residence(s) attached to the main residence (e.g., basement apartment) **and/or detached** (e.g., mobile home, carriage house)**?**

a ☐ Attached – *Change item 12a to multiunit, then go to 14a.*
b ☐ Detached – *SKIP to 16 then go to the next line number and record other residence.*
2 ☐ No – *SKIP to 16*

MULTIUNIT ADDRESS

(14a) *Canvass the multiunit and enter the number of units on each floor.*

Basement | 1st floor | 2nd floor | 3rd floor | 4th floor | 5th floor | 6th floor
7th floor | 8th floor | 9th floor | 10th floor | 11th floor | 12th floor | Attic
☐ Other –

Example: "5 APTS 14th FLR"

(14b) *(Ask if an apartment or a condominium)* **How many apartments, occupied or vacant, are there at** *(address)***?**

____ Total number of Housing Units (occupied or vacant)

(15) Remarks – *Do not use this space for location description.*

(16) Information obtained from: 1 ☐ HH member* 2 ☐ Proxy* 3 ☐ Manager* 4 ☐ Observation

*Respondent name | Telephone No.

OFFICE EDIT IL | QC | CL | QC CL | DQC

If multiunit (answered 14b), then go to Section 5, Multiunit Address Page.

Section 5 – MULTIUNIT ADDRESS PAGE

Ask the manager of an apartment complex – **Do you have any maps of the apartment complex that I can take with me?**

(1) Map Spot No. Number Letter	**(9)** Map Spot No. Number Letter	**(17)** Map Spot No. Number Letter
(2) House No. **(3a)** Road/Street name	**(10)** House No. **(11a)** Road/Street name	**(18)** House No. **(19a)** Road/Street name
(3b) Structure Identifier	**(11b)** Structure Identifier	**(19b)** Structure Identifier
(4a) Rural Rte. No. **(4b)** Box No. **(5)** PO Box No.	**(12a)** Rural Rte. No. **(12b)** Box No. **(13)** PO Box No.	**(20a)** Rural Rte. No. **(20b)** Box No. **(21)** PO Box No.
(6) City **(7)** ZIP Code	**(14)** City **(15)** ZIP Code	**(22)** City **(23)** ZIP Code
(8) Name of complex *(if applicable)*	**(16)** Name of complex *(if applicable)*	**(24)** Name of complex *(if applicable)*

	Unit designation (a)	Unit status (b)		Unit designation (c)	Unit status (d)		Unit designation (e)	Unit status (f)	Line No.	Unit designation (g)	Unit status (h)	Line No.	Unit designation (i)	Unit status (j)	Line No.	Unit designation (k)	Unit status (l)
1			21			41			61			81			101		
2			22			42			62			82			102		
3			23			43			63			83			103		
4			24			44			64			84			104		
5			25			45			65			85			105		
6			26			46			66			86			106		
7			27			47			67			87			107		
8			28			48			68			88			108		
9			29			49			69			89			109		
10			30			50			70			90			110		
11			31			51			71			91			111		
12			32			52			72			92			112		
13			33			53			73			93			113		
14			34			54			74			94			114		
15			35			55			75			95			115		
16			36			56			76			96			116		
17			37			57			77			97			117		
18			38			58			78			98			118		
19			39			59			79			99			119		
20			40			60			80			100			120		

UNIT STATUS: **1** – Occupied or vacant and intended for occupancy **2** – Under construction (started) **3** – Future construction (not started) **4** – Unfit for habitation **5** – Boarded up **6** – Storage of household goods **8** – Other

FORM D-1302 (12-9-2008)

Section 6 – MOBILE HOME PARK PAGE

Ask the contact person of the mobile home park – **Do you have any maps of the mobile home park that I can take with me?**

Mobile home park address **(1)** Block No.

(2) House No. **(3a)** Road/Street name

(3b) Structure Identifier

(4a) Rural Rte. No. **(4b)** Box No. **(5)** PO Box No.

(6) City **(7)** ZIP Code

(8) What is the total number of mobile homes, trailers, AND empty trailer lots/sites in the park?

(9) Mobile home park number

(10) Name of park

(11) Name/Title/Phone No. of contact person for park

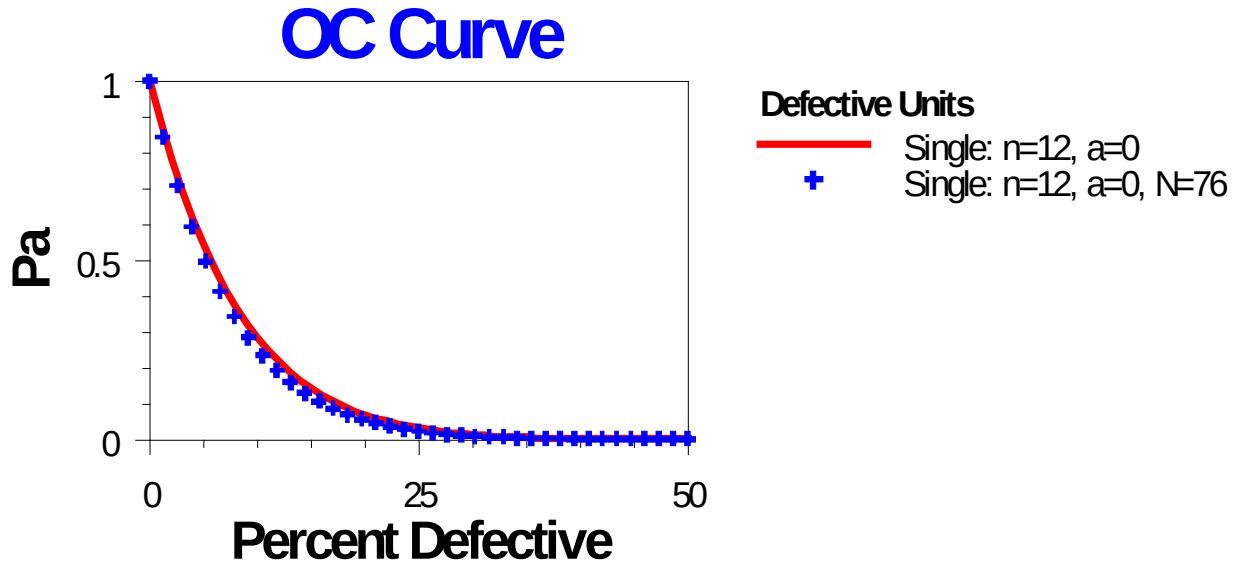
(12) Information obtained from ▶ 1 ☐ HH member 2 ☐ Proxy 3 ☐ Manager 4 ☐ Observation

Line No.	Map Spot No. (a) Number	Map Spot No. (a) Letter	House No. (b)	Lot No. (c)	Physical location description (d)	Road/Street name (e)	Rural Rte. No. (f)	Box No. (g)	PO Box No. (h)	Unit status (i)	ZIP Code (j)	*Obtain householder name for areas with non-city style addresses* (k) First	MI	Last
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

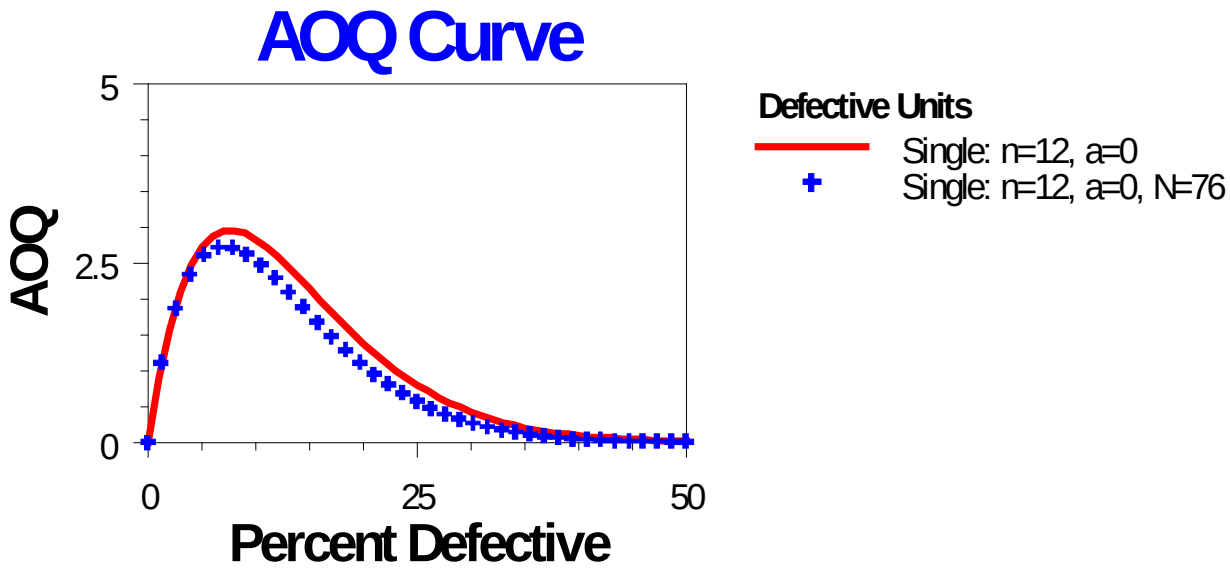
▶ **UNIT STATUS:** **1 –** Occupied or vacant and intended for occupancy **4 –** Unfit for habitation **5 –** Boarded up **6 –** Storage of household goods **7 –** Empty trailer lot/site **8 –** Other

FORM D-1302 (12-9-2008)

Operating Characteristic Curve



Average Outgoing Quality Curve



Weekly Data Keying Verification Reports for the Observation Checklists and Independent Listing Books

WEEKLY DATA KEYING VERIFICATION REPORT

Project: 5312 **Processing Year: 2010**
Job Name: ILBOBSPR INDEPENDENT LISTING OBSERVATION CHECKLISTS-PUERT
Date Range: 01/10/2010 - 01/16/2010 **Cum Date Range:** 01/10/2010 - 01/16/2010
Special Report:

	THIS WEEK					CUMULATIVE				
	100 %	20%	10 %	5 %	Total	100 %	20%	10 %	5 %	Total
UnitCount	4	0	0	0	4	4	0	0	0	4
Accept	0	0	0	0	0	0	0	0	0	0
Reject	0	0	0	0	0	0	0	0	0	0
KeyedDocuments	179	0	0	0	179	179	0	0	0	179
VerifiedDocuments	179	0	0	0	179	179	0	0	0	179
KeyedRecords	586	0	0	0	586	586	0	0	0	586
VerifiedRecords	588	0	0	0	588	588	0	0	0	588
KeyedFields	3974	0	0	0	3974	3974	0	0	0	3974
VerifiedFields	3973	0	0	0	3973	3973	0	0	0	3973
ChargeFieldErrors	9	0	0	0	9	9	0	0	0	9
ChargeErrorRate	0.23%	0.00%	0.00%	0.00%	0.23%	0.23%	0.00%	0.00%	0.00%	0.23%
TotalErrors	36	0	0	0	36	36	0	0	0	36
TotalErrorRate	0.91%	0.00%	0.00%	0.00%	0.91%	0.91%	0.00%	0.00%	0.00%	0.91%

WEEKLY DATA KEYING VERIFICATION REPORT

Project: 5312 **Processing Year: 2010**
Job Name: ILBOBSUS INDEPENDENT LISTING OBSERVATION CHECKLISTS
Date Range: 01/10/2010 - 01/16/2010 **Cum Date Range:** 01/03/2010 - 01/16/2010
Special Report:

	THIS WEEK					CUMULATIVE				
	100 %	20%	10 %	5 %	Total	100 %	20%	10 %	5 %	Total
UnitCount	53	0	0	0	53	71	0	0	0	71
Accept	0	0	0	0	0	0	0	0	0	0
Reject	0	0	0	0	0	0	0	0	0	0
KeyedDocuments	2445	0	0	0	2445	3050	0	0	0	3050
VerifiedDocuments	2445	0	0	0	2445	3050	0	0	0	3050
KeyedRecords	8604	0	0	0	8604	10702	0	0	0	10702
VerifiedRecords	8604	0	0	0	8604	10706	0	0	0	10706
KeyedFields	53639	0	0	0	53639	67090	0	0	0	67090
VerifiedFields	53658	0	0	0	53658	67146	0	0	0	67146
ChargeFieldErrors	225	0	0	0	225	306	0	0	0	306
ChargeErrorRate	0.42%	0.00%	0.00%	0.00%	0.42%	0.46%	0.00%	0.00%	0.00%	0.46%
TotalErrors	254	0	0	0	254	376	0	0	0	376
TotalErrorRate	0.47%	0.00%	0.00%	0.00%	0.47%	0.56%	0.00%	0.00%	0.00%	0.56%

WEEKLY DATA KEYING VERIFICATION REPORT

Project: 5312 **Processing Year:** 2010
Job Name: CCMILB CENSUS COVERAGE MEASUREMENT IND LISTING BK
Date 12/20/2009 - 12/26/2009 **Cum Date Range:** 09/06/2009 - 12/26/2009
Special Report:

	THIS WEEK					CUMULATIVE				
	100 %	20%	10 %	5%	Total	100 %	20%	10 %	5 %	Total
UnitCount	55	0	0	0	55	11835	0	0	0	11835
Accept	0	0	0	0	0	0	0	0	0	0
Reject	0	0	0	0	0	0	0	0	0	0
KeyedDocuments	154	0	0	0	154	14266	0	0	0	14266
VerifiedDocuments	154	0	0	0	154	14266	0	0	0	14266
KeyedRecords	15284	0	0	0	15284	755362	0	0	0	755362
VerifiedRecords	15283	0	0	0	15283	755297	0	0	0	755297
KeyedFields	225557	0	0	0	225557	10145870	0	0	0	10145870
VerifiedFields	225798	0	0	0	225798	10152202	0	0	0	10152202
ChargeFieldErrors	2038	0	0	0	2038	64693	0	0	0	64693
ChargeErrorRate	0.90%	0.00%	0.00%	0.00%	0.90%	0.64%	0.00%	0.00%	0.00%	0.64%
TotalErrors	2151	0	0	0	2151	78460	0	0	0	78460
TotalErrorRate	0.95%	0.00%	0.00%	0.00%	0.95%	0.77%	0.00%	0.00%	0.00%	0.77%

WEEKLY DATA KEYING VERIFICATION REPORT

Project: 5312 **Processing Year:** 2010
Job Name: PRCCMILB CENSUS COVERAGE MEASUREMENT IND LISTING BK
Date 12/27/2009 - 01/02/2010 **Cum Date Range:** 10/11/2009 - 01/02/2010
Special Report:

	THIS WEEK					CUMULATIVE				
	100 %	20%	10 %	5 %	Total	100 %	20%	10 %	5 %	Total
UnitCount	19	0	0	0	19	529	0	0	0	529
Accept	0	0	0	0	0	0	0	0	0	0
Reject	0	0	0	0	0	0	0	0	0	0
KeyedDocuments	88	0	0	0	88	795	0	0	0	795
VerifiedDocuments	88	0	0	0	88	795	0	0	0	795
KeyedRecords	8611	0	0	0	8611	57529	0	0	0	57529
VerifiedRecords	8608	0	0	0	8608	57525	0	0	0	57525
KeyedFields	151915	0	0	0	151915	908631	0	0	0	908631
VerifiedFields	145390	0	0	0	145390	902942	0	0	0	902942
ChargeFieldErrors	1808	0	0	0	1808	10405	0	0	0	10405
ChargeErrorRate	1.24%	0.00%	0.00%	0.00%	1.24%	1.15%	0.00%	0.00%	0.00%	1.15%
TotalErrors	3116	0	0	0	3116	17343	0	0	0	17343
TotalErrorRate	2.14%	0.00%	0.00%	0.00%	2.14%	1.92%	0.00%	0.00%	0.00%	1.92%